THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—SEPTEMBER, 1944

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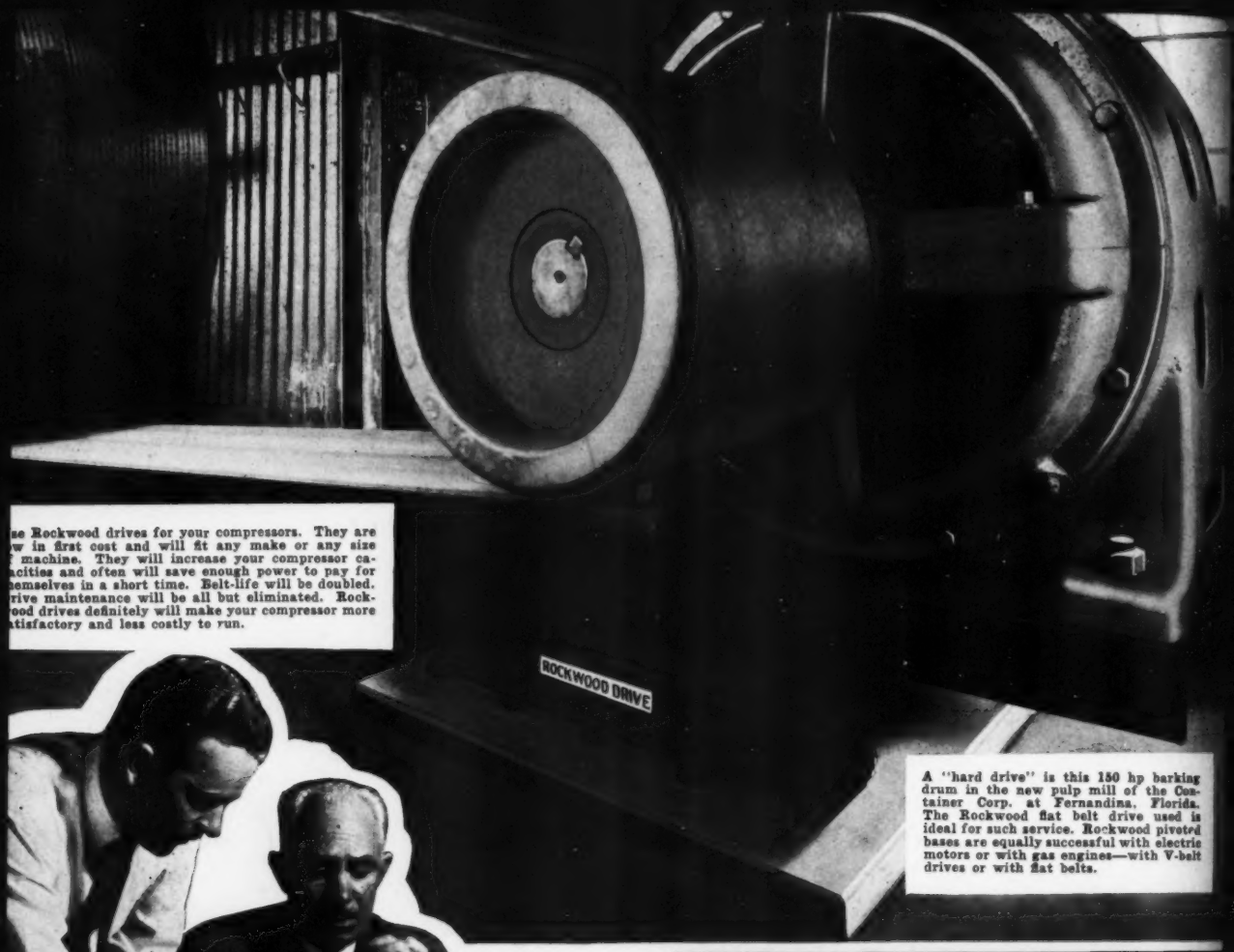
ONE MINUTE • *War Machinery*
NEXT MINUTE • *Paper Mill Machinery*

Reconversion is no problem with us; it's simply a matter of issuing orders and blueprints to our Pattern Shop, Foundry, Machine Shop, etc. . . . Of course, we've added many new, modern, precision-production machine tools and other equipment to increase our war machinery output, BUT everything we've added will remain to help us build even better paper mill machinery. We can be ready to start manufacturing your new or replacement machinery needs in a minute after our government permits us to do so. . . . But we can't start manufacturing until designs and specifications are determined. The sooner you consult our engineers, the sooner you place your order—then, the sooner you'll get your machinery. . . . The Downingtown Manufacturing Company, Downingtown, Pennsylvania.



se Rockwood drives for your compressors. They are w in first cost and will fit any make or any size machine. They will increase your compressor ca- acities and often will save enough power to pay for hemselves in a short time. Belt-life will be doubled. rive maintenance will be all but eliminated. Rock- ood drives definitely will make your compressor more tisfactory and less costly to run.

A "hard drive" is this 150 hp barking drum in the new pulp mill of the Container Corp. at Fernandina, Florida. The Rockwood flat belt drive used is ideal for such service. Rockwood pivoted bases are equally successful with electric motors or with gas engines—with V-belt drives or with flat belts.

"The belt tightness matches the load—increasing when the load increases—falling off when the load falls off —and AUTOMATICALLY."

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"They Improve Machine Performance"

"You recall chief you have always said we will do anything that gives us improved machine performance and does not take too long to pay for itself. Well, that's exactly what these Rockwood automatic belt tightening drives will do for us."

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"We have them on 4 beaters now and are going to put them on the others as soon as the present belts wear out. Same with all belted electric drives thruout the mill."

"And we get good service on the bases, too. They have them in stock to 60 h.p.—in semi stock to 250 h.p.

IF YOU HAVE A DRIVE PROBLEM THAT NEEDS CORRECTING WRITE US.

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Specialists in Power Transmission Equipment Since 1884

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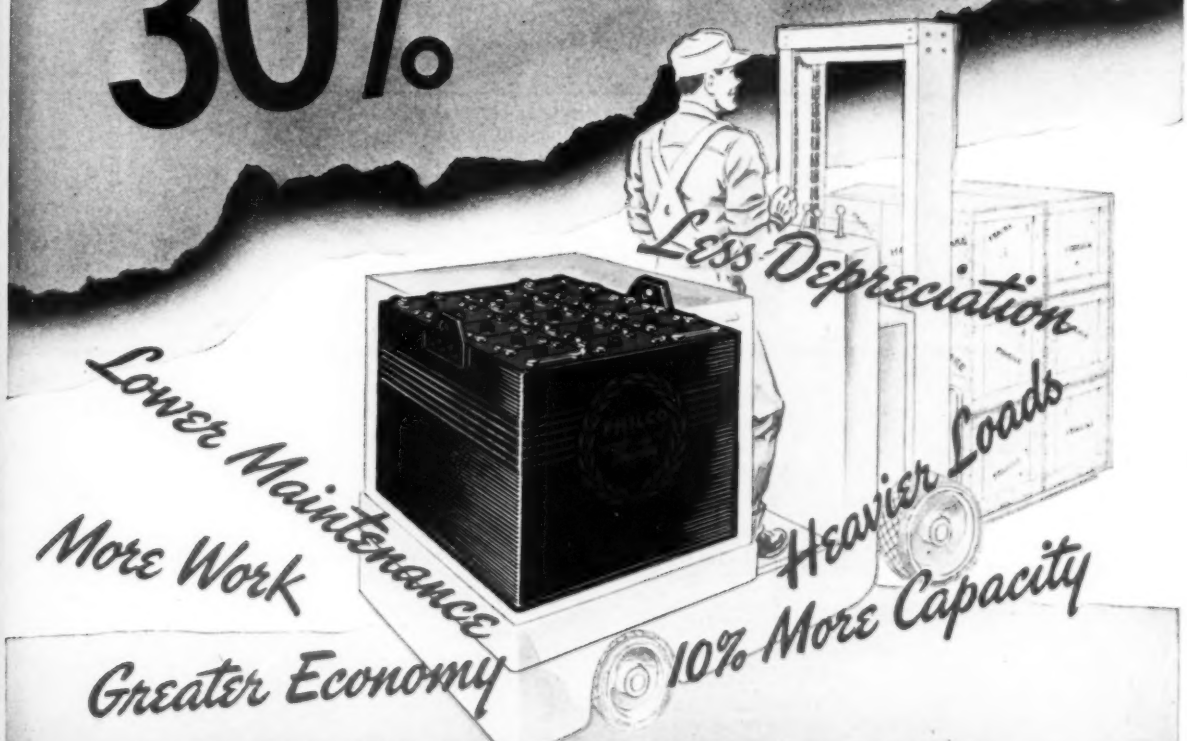

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At last, a motive power battery with a revolutionary, new construction that actually gives you *30% longer life . . . and more!* A brand new principle of fabricated insulation . . . developed after years of research in the Philco laboratories, and now introduced after exhaustive tests in actual service. It's the *Philco "Thirty"* . . . your post-war battery, available now in certain types and limited quantities. Write today for full information.

PHILCO CORPORATION, *Storage Battery Division, Trenton 7, New Jersey*

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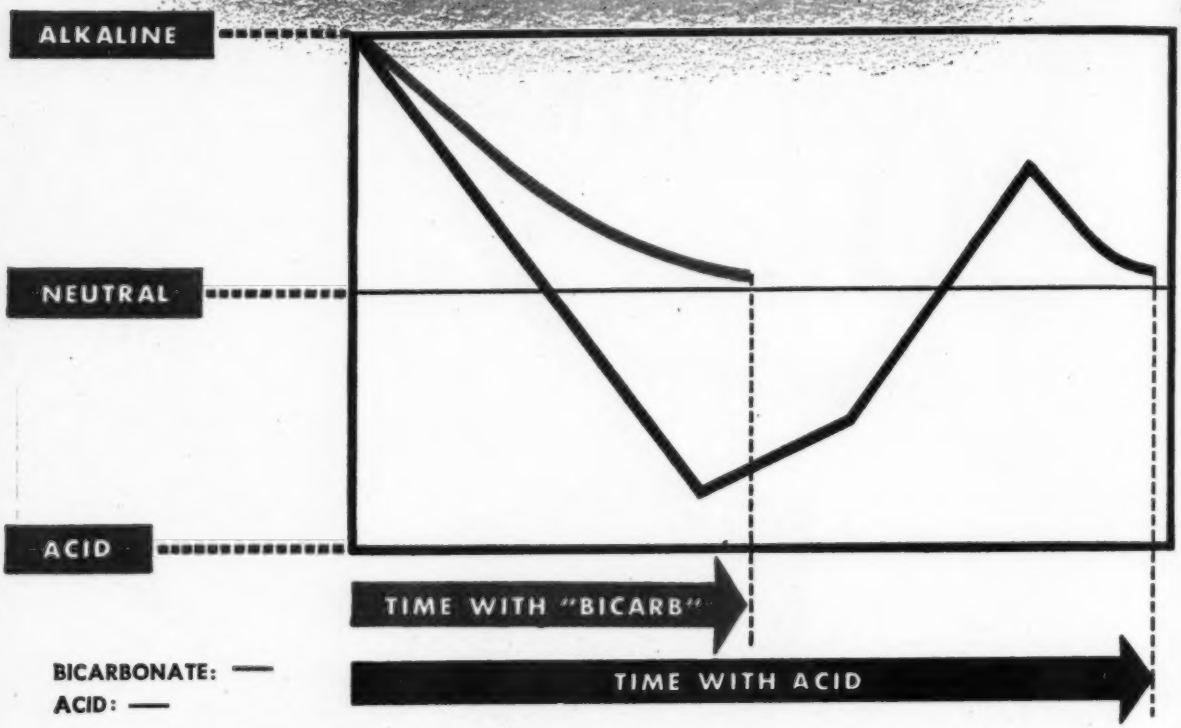
USE "BICARB" TO REMOVE CAUSTIC!*



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Eliminating acid's disadvantages, bicarbonate of soda effectively removes caustic by changing it into sodium carbonate or soda ash.

Commercially developed by Mathieson, this new process achieves decided advantages over customary acid neutralization:

- *acid resistant equipment not required.*
- *no health or other hazards involved.*
- *production speeded by elimination of additional steps necessitated by acid process.*
- *careful chemical control unnecessary.*

These advantages, plus new ones stemming from intensive research, may hold important meaning for you – may bring to light possibilities you haven't thought of.

While complete details for the utilization of this process have been evolved specifically for textiles, Mathieson Research is prepared to carry out further assignments in other fields.

For best results, consult our Technical Staff in regard to adapting this new Mathieson development to your particular operations. Write for further information.

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* Developed in collaboration with Pepperell Manufacturing Company

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Powell's Past ...your assurance of Future Performance

For every problem in flow control, there'll always be a POWELL Valve to lick it!

Powell Valves for controlling flow in your industry were not just "born"—they're a product of evolution—the result of nearly a century of patient study, research and experimentation by Powell's staff of Engineers and Metallurgists. Therefore you can be sure TODAY that TOMORROW—as in the past—there'll be Powell Valves to meet every existing requirement for dependable flow control. Here are a few examples of the POWELL Line of All-Iron Valves—especially suitable for handling caustic soda, bleaching compounds, acids and other media destructive to copper and copper base alloys. The complete POWELL Line includes valves of all types and materials* required to handle every media used in the Soda Mill, Sulphate or Sulphite processes.

The Wm. Powell Company

Dependable Valves Since 1846

Cincinnati 22, Ohio

Fig. 1816—Gate Valve for 125 pounds W.S.P. Has flanged ends, outside screw rising stem, bolted flanged yoke and taper wedge solid disc.

The valves shown are available made in all Iron or Iron with Stainless Steel Trim, depending upon the services in which they are to be used.

Fig. 480—"Pilot" Gate Valve for 150 pounds W. S. P. (½" to 2") and 125 pounds W. S. P. (2½" to 3"). Has screwed ends, outside screw rising stem, bolted flanged yoke and taper wedge solid disc.

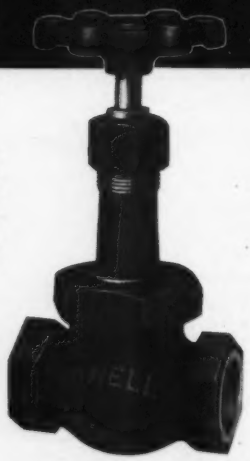


Fig. 171—Globe Valve for 150 pounds W.S.P. Has screwed ends, union bonnet and regrindable, renewable iron disc.

*Write Dept. N, The Wm. Powell Co., for our new booklet—"Powell Valves for Corrosion Resistance."

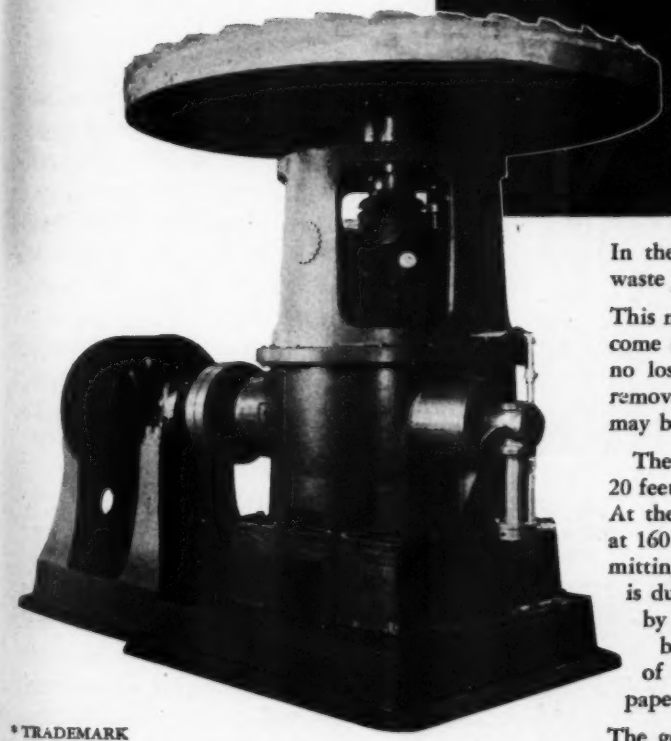
Fig. 457—Globe Valve for 125 pounds W.S.P. Has flanged ends, outside screw rising stem, bolted flanged yoke and regrindable, renewable iron disc.

POWELL VALVES

THE HYDRAPULPER* AND TIMKEN BEARINGS are helping to relieve the paper shortage

General view of Hydrapulper.

Heavy-duty drive and rotor of Hydrapulper. Timken Bearing Equipped throughout.



In the Hydrapulper, a new method of reclaiming waste paper has demonstrated remarkable efficiency.

This machine takes the bales of waste paper as they come and converts them into pulp with practically no loss. Furthermore, its accessories automatically remove all foreign matter—string, rags, etc.—that may be in the bales.

The 20 ft. size Hydrapulper consists of a tank 20 feet in diameter, holding 10,000 gallons of water. At the bottom of the tank is a large rotor driven at 160 RPM through a heavy-duty gear drive transmitting up to 200 HP. As soon as the waste paper is dumped into the tank, it is sucked downwards by the vortex action where it is hit repeatedly by the rotor and thrown outwards to the side of the tank. This process continues until the paper is completely disintegrated.

The gear drive, of which there are 3 sizes, is vital to the performance of the Hydrapulper, so it is significant to note that both horizontal and vertical drive shafts and pulley shaft are mounted on Timken Tapered Roller Bearings. Timken Bearings were selected because of their ability to carry the heaviest radial, thrust and shock loads; to hold the drive shafts in correct and constant alignment; to permit precision adjustment of the hypoid drive gears; and to stand up and deliver dependable service under 24 hour duty. The Timken Roller Bearing Company, Canton 6, Ohio.

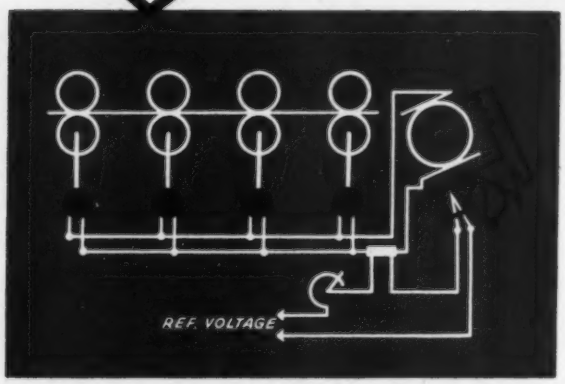
* TRADEMARK

Built By
Dilts Machine Works, Fulton, New York
Shartle Bros. Mach. Co., Middletown, O.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

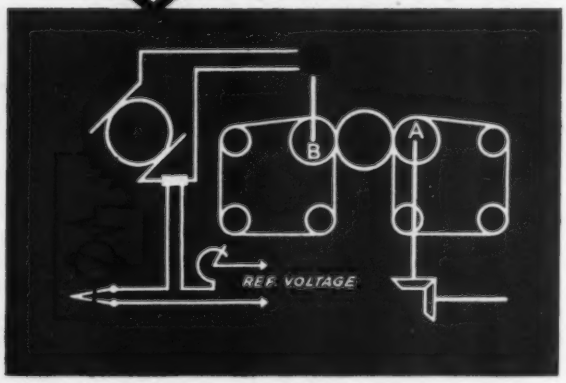
HELPER DRIVES that

AUXILIARY WET-END DRIVE



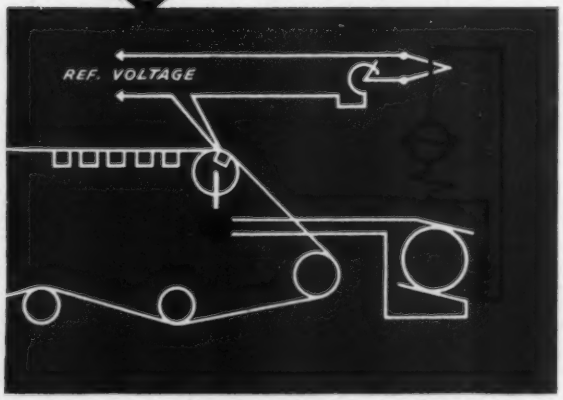
G.E.'s well-proved system for auxiliary wet-end drive of cylinder machines has now been made more efficient than ever in relieving the load on felts at any and all machine speeds. Cylinder moulds, suction rolls, and primary presses are individually powered by "helper" motors which take a predetermined share of the load at every speed right down to standstill. Motors operating from an amplidyne-excited generator remove the friction load from the felts without interfering with draw adjustments.

DUAL-PRESS DRIVE



. Normally, the press roll (A) is driven from a back-line shaft, or by a sectional-drive motor, with the second roll (B) driven mechanically from the first. This causes friction or slippage at the nip, particularly if rolls are slightly different in diameter. G.E.'s new system permits the helper motor on (B) to operate at constant current (constant torque), so adjusted as to just balance the friction load. *Now*, actual operating speed will be determined by press roll (A), and the friction load of (B) will be taken automatically by the motor.

PRIMARY COUCH-ROLL DRIVE



The section of the machine shown at left has a primary couch roll driven by a "helper" motor. Because of the small arc of contact with the wire, slippage is sure to occur if the torque is out of line. By means of a vacuum-measuring device at the suction box acting through the G-E amplidyne, motor torque is precisely and instantly adjusted as changes in vacuum occur.

●

Note: The compensating and main control field windings of the amplidyne have the same magnetic axis as the load current in the armature.

"baby" your felts

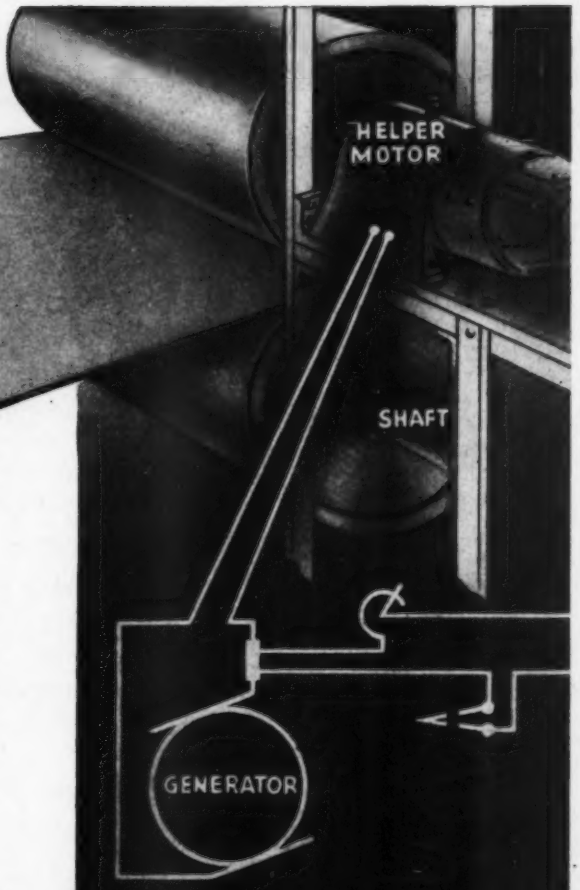
Simple, new, save-the-load control system, making use of the G-E amplidyne, keeps motor torque "on the beam" regardless of machine speed.

NEW, wide-range flexibility and simplicity have now been added to the service-proved advantages of G-E auxiliary drives for paper machines. Felts are more fully protected from strain and friction, draw is more accurately regulated, acceleration and deceleration are smoothly accomplished.

This basic improvement in helper-drive operation results from application of the instantly responsive G-E amplidyne to load regulation and speed control. Helper motors on any roll or group of rolls will furnish the torque to take all the drive load off the felts, regardless of operating speeds or speed changes. Or they can be controlled in accordance with the suction-box vacuum or other variables so as to counterbalance changes in load. They are equally applicable to mechanically driven or electrically driven machines, from board to tissue, *old or new.*

The simplicity of the new control system backs up the well-proved dependability of G-E drive motors and generators in paper-mill service.

Our application engineering combines the most advanced electrical methods with a broad background of practical experience on sectional drives, wet-end drives, and other paper-mill electrification problems. *General Electric Co., Schenectady 5, N.Y.*



TOP-ROLL DRIVE

By means of amplidyne control, a "helper" motor driving the top roll can relieve the friction load on the felts and wet sheet, without adding to the complexity of speed control. Motor torque is maintained at constant level, thus offsetting friction load, regardless of operating speed.

GENERAL ELECTRIC

PAPER MILL DRIVES

Buy all the BONDS you can—*and keep all you buy*

EVER BURN WOOD TO MAKE PAPER?

Eighty-five years ago most American paper mills were built close to the forests where wood was plentiful and cheap and coal was scarce and costly. The cord wood was converted into pulp — tops and slabs were burned to generate steam.*

Even then Hamilton Felts were relied upon to remove water from the web and thereby reduce the amount of steam needed at the dryer rolls. Paper makers had already discovered that Hamilton Felts not only delivered dryer sheets to the rolls but that they also gave better formation to the paper, reduced broke and enabled the machines to be operated at higher speeds with fewer stops for adjustment.

Regardless of the fuel you burn and of the type of paper or board you manufacture, there is still a Hamilton Felt that will do your work better, faster and at lower cost.

*Wood was the fuel used under the boilers at the Miami Woolen Mills as late as 1869.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

NEVILLE

NEVILLAC* RESINS

Hard Nevillac · Soft Nevillac · LX-483 Nevillac · Nevillac 10°

*REG. U. S. PAT. OFF.

These phenol-coumarone-indene resins, (the last two listed are viscous liquids) because of their unusual compatibility and plasticizing properties, are being widely used in the manufacture of:

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MISCELLANEOUS

Laminating Varnishes
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Army Raincoats
Paints and Varnishes
Printing and duplicating inks

NEVILLAC RESINS are soluble in alcohol, hydrocarbons, ketones, esters, ethers and chlorinated hydrocarbons. They are compatible with most synthetic resins including cellulose esters, and ethers, vinyl acetate, vinyl butyral and zein (corn protein) and partly with vinyl acetate and chloride copolymer.

They are not under allocation but require AA priority ratings to effect shipment. Write us for further information and samples.

A-10

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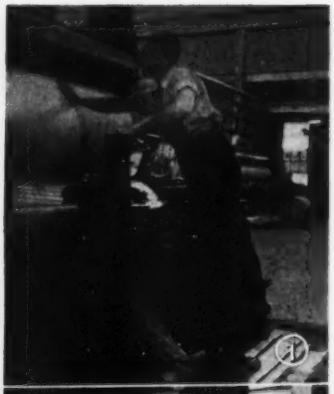


Safety Lessons in Paper Mills

● One truth shines more clearly than ever through the onslaught of war's destruction. This truth, common to all nations, is that manpower is the lifeblood of any nation, and should be preserved at any cost. Men are needed to fight the "Battle of Production" just as men are needed in actual combat with the enemy.

On this page and the following pages some typical paper mill accidents are illustrated. These pictures were taken in a paper mill for the purpose of making a special study of such accidents in its wartime safety program.

1—Feeling for [illegible] on [illegible] in motion is an invitation for [illegible]. This is an old paper habit which in [illegible] should be discontinued. Paper [illegible] can make any "wrinkles" visible and [illegible] for them.

2—A [illegible] between moving rolls in [illegible] stationary paper. This practice [illegible] is especially dangerous [illegible] is the quickest.

3—[illegible] in the nip of a [illegible] machinery has teeth [illegible] with the same [illegible] animal.

4—A [illegible] but the proper [illegible] is not [illegible].

5—[illegible] all amputations [illegible]. Just think how [illegible] eliminated if all [illegible] with the left hand.

6—The [illegible] and cables [illegible] tail. Persons who work [illegible] riding dangerous [illegible].

7—In [illegible] to prevent the [illegible] operation should be done when [illegible] at a slow rate of speed, and [illegible] in the rope are removed.

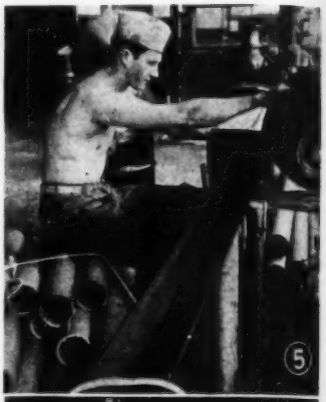
8—Some people [illegible] water on the hose to clean floors. When [illegible] used in this manner, every person in the vicinity of the work should be cautioned and the men on the hose should wear goggles.

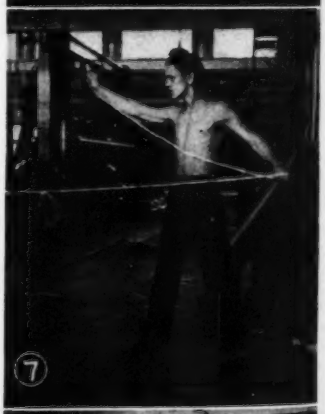
9—Games and [illegible] are excellent for relaxation; but horse-play in the mill such as sliding down a broke beater chute is taboo at all times.

10—It's remarkable what a new pair of pants and shoes, and a clean collar and shirt can do for a man from a Safety as well as a sanitary point of view.

11—The nails in the board may be new, but they might harbor thousands of tetanus (lockjaw) germs which could cause a horrible, and usually fatal, sickness. All nails should be removed from discarded boards immediately.

12—A ladder, unless properly placed, often slips. It should either be held at the foot by a helper or tied by rope to an upright.





(The illustrations on these pages appeared with an article entitled "Safety in this Battle of Production," published in the April, 1942, issue of this magazine.)

TRADE WINDS

Department of Labor Organizes to Conserve Manpower

▶▶▶ A MANPOWER CONSERVATION DRIVE to cut industrial accidents by 1,000,000 in the next twelve months was undertaken by the United States Department of Labor in May of this year (cf. P.I. & P.W., June, 1944, page 336).

The Department feels that preventable work accidents constitute a serious drain on American war economy, which makes imperative that everything possible be done to conserve industrial manpower.

The first industry to be organized for safety under this movement was the meat packing industry. This campaign is under way and is proving very successful.

The second industry-wide safety drive sponsored by the Labor Department is to be launched in the paper and pulp industry October 1 to run for a period of three months.

The purpose of the plan is twofold: (1) To offer to most of the individual establishments during a three-month period, the services of expert safety consultants, drawn from the co-operating agencies, in the establishment and operation of a sound plant program, and in the solution of technical safety problems. (2) To assist existing trade and labor organizations within the industry in the establishment of a sound, permanent safety program, on an industry-wide basis.

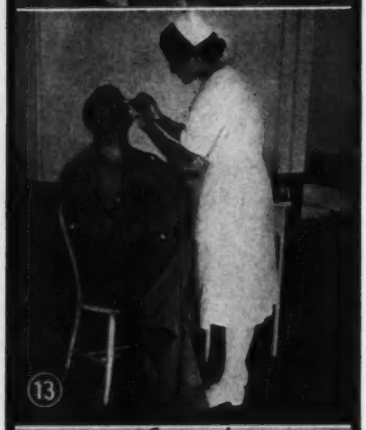
The program was formulated through the collaboration of a national advisory group . . . representatives of sixteen national agencies. This group will outline the operation of the plan, relegate specific duties of the various co-operating agencies, assist in the preparation of material for distribution through those agencies to individual paper and pulp establishments.

A secretariat will be lodged in the Division of Labor Standards, United States Department of Labor, the technical safety staff of which will be

EDITOR'S NOTE: The campaign announced on this page is to be conducted throughout the 900 pulp and paper mills of the Nation. Trained safety engineers from the Labor Department or from the co-operating organizations will survey plant hazards and unsafe practices and recommend corrective measures. Assistance will be given in development of safety organizations in mills not already organized.

Attention is drawn to figures given by the Bureau. These figures cover ALL mills, and for that reason they do not agree with figures released by the National Safety Council which are drawn from member reporting mills. For instance—the Bureau gives the frequency in pulp and paper mills for 1943 as 26.3 per million man-hours. This is higher than the National Safety Council's report for members of 21.52. The Bureau also gives the iron and steel industry's frequency rate as 10, whereas the N.S.C. reports 7.41. These figures DO prove that where organized safety work is carried on, accidents can be reduced.

Since 1925, annual contests have been conducted by the N.S.C. for its members of the Paper and Pulp Section. From the inception of these contests, Edward Benton Fritz, founder of Fritz Publications, Inc. (publisher of this magazine) awarded a major trophy each year. Since 1939, this trophy has been known as the Edward Benton Fritz Memorial Trophy, and that trophy for the contest ended June 30, this year, will be awarded at a dinner meeting of the Paper and Pulp Section of the National Safety Council on Tuesday evening, October 3, during the annual Safety Congress in Chicago.



made available for work in preparing necessary studies. Statistical material on accidents in plants coming into the program will be collected, processed, and reported to the plants individually and to the co-operating agencies by the Bureau of Labor Statistics, United States Department of Labor. The actual operation of the program will be centered in the respective states, with the various co-operating agencies in each state working together to assure coverage and servicing of all paper and pulp establishments within the state. Statistics will be reported on a State basis, the names of the reporting establishments being withheld.

The paper and pulp industry consists of some 900 individual plants, more than three-fourths of them producing paper. The total employment is something under 150,000. The United States Bureau of Labor Statistics records that in 1943 the paper and pulp industry had a record of 10,900 workers injured (one or more days lost time); $2,000,000 paid in compensation claims; 8,000,000 man-hours lost.

13—The eye is the most delicate and vulnerable mechanism of the body. Willing but untrained hands should never replace the skill of first aid attendants in removing a speck or dirt particle from it.

14—Comparatively small, miscellaneous material, such as brick, should never be hoisted with a rope sling because of the possibility of such objects falling from it, thus creating an accident hazard. A bucket placed in a basket made of steel straps has proven very satisfactory in this service.

With a frequency rate of 26.3 lost-time injuries per million man-hours, it means that one out of every seventeen workers was injured during the year. Thus the industry piled up one of the ten highest accident records for the year—according to the Bureau—far higher than that for the iron and steel industry which had a rate of 10.

Heading the list of organizations enlisted in this campaign is the National Safety Council. During the thirty-one years since it was founded, this organization has become a veritable university of safety education, and it has won the support of practically all of the leading industries. The Council disseminates regularly a vast amount of data and safety statistics based on reports from its members.

The American Paper and Pulp Association, the International Brotherhood of Paper Makers, International Brotherhood of Pulp, Sulphite and Paper Mill Workers are giving their support to the campaign. Other co-operating agencies are: American Mutual Alliance, American National Red Cross, American Standards Association, the Department of Agriculture, Department of Commerce, International Association of Governmental Labor Officials, National Bureau of Standards, National Conservation Bureau, National Fire Protection Association, U. S. Chamber of Commerce, and the Public Health Service.

(*An important announcement concerning the 1944 National Safety Congress will be found on page* 738.)

NEW LAMINATED PAPER BOMB BAND DEVELOPED

A wheel-like, laminated paper bomb band is among the interesting unique wartime developments achieved by industry to meet the critical materials situation. This new product is a co-operative development of the Alton Box Board Company, Alton, Illinois, and the Kenray Company, of Milwaukee, Wis.

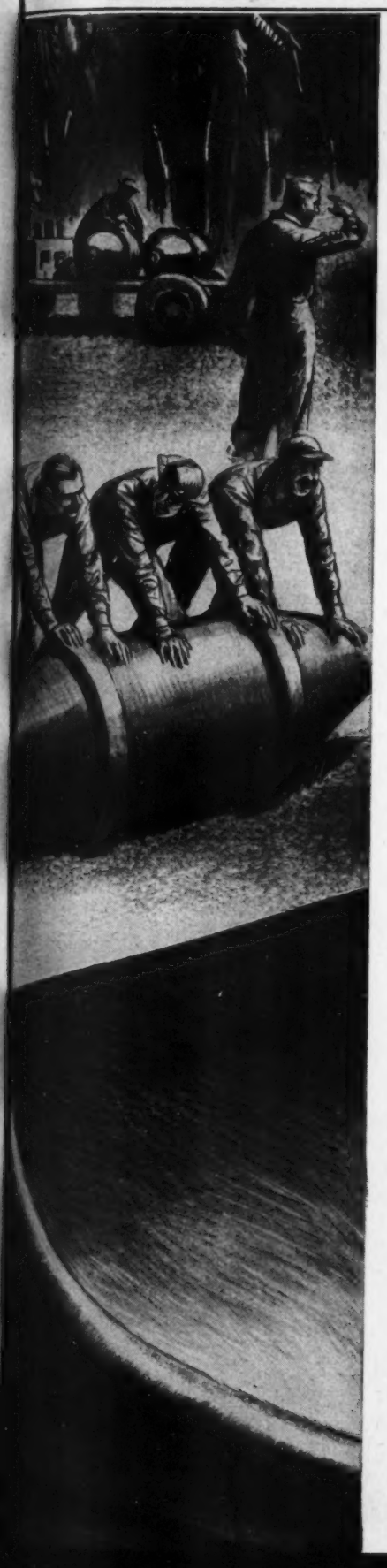
Previous to this development, bombs were equipped with steel bands to serve the same purpose. Each of these steel bands required 13 pounds of critical material—which was reduced to 2 pounds, 10 ounces per band through the substitution of paperboard bands. It has been estimated that this change-over has resulted in the saving of approximately 200,000,000 pounds of steel annually.

In the development of these paper bands, certain very rigid conditions had to be met. Specifications called for materials that would be absolutely waterproof—that would withstand rain, mud, and snow, as well as being light in weight and able to withstand extremely severe usage. The Kenray Company was organized primarily to formulate and produce the highly specialized industrial adhesive required for the bomb band project. Employing a synthetic resin base, this company developed a moisture-proof adhesive, which, when applied to fiberboard, could be immersed in water for a period of seven days and seven nights at a temperature of 70 Fahr., without absorbing more than 25 per cent moisture.

The Alton Box Board Company went into production on bomb bands equipped with this moisture-resistant adhesive. The bands are made by machine-winding and gluing paperboard stock convolutely into a solid rim.

James R. Lyon, chemical research engineer of the Kenray Company, was formerly on the staff of the Institute of Paper Chemistry; he is a gradu-

PAPER · · · America's 6th Industry



PAPER RINGS FOR ROLLING BOMBS

(NEWS ITEM: *Paperboard rings to guard aerial bombs during transportation are saving two hundred million pounds of steel annually.*)

From the time an aerial bomb leaves the factory until it is placed in the bomb bay of a plane, specially-treated paperboard rings protect it . . . make it easy to transport. These paperboard rings are actually more shock-resistant, lighter and easier to handle than metal bands. They can withstand rain, mud and snow.

Paper for camouflage . . . paper for insulation . . . paper drums for inflammable liquids . . . waterproof paperboard containers for food and equipment . . . New uses for paper, calling for new standards of lightness and toughness; new standards of quality in performance . . . New responsibilities—new opportunities for the Pulp and Paper Industry.

American Industry is at War—thinking and working at hitherto unheard of speeds. The many practical and technical advantages discovered by the Puseyjones Research and Development Committee while working on the problems of war, will be of incalculable value to America at peace—to the Paper Making Machinery of the future.

Puseyjones engineers will welcome the opportunity to work with you in your plans for the future. We have prepared three informative articles: "The Post-War Fourdrinier," "Development of Stream-Flow Vat System," "The Flow Spreader." Ask for reprints by name.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
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ate of the New York State College of Forestry. Paul A. West, sales manager and new products development engineer, has had extensive experience in the production and distribution of paper products dispensing devices.

◆

ONTARIO-MINN. CO. DEVELOPING FOREST MANAGEMENT PLAN

The Ontario-Minnesota Pulp & Paper Company, Ltd., is understood to be developing a forest management plan in the Fort Frances, Ontario, district with a view to putting its limits on a sustained yield basis, as well as to build up a permanent wood reserve in the area. The result of an understanding between the paper company and the Ontario Government at the time the firm obtained its timber license in 1942, the plan is described as the most comprehensive study of natural forest resources ever attempted in the area.

Nearly 5,500 square miles, including four district limits, will be studied. Some 6,000 photographs will be required to complete accurate mapping of the area and to date over 2,500 have already been taken by the company, which arranged with the Department of Lands and Forests to furnish planes and equipment. Data being gathered includes amount, age, class, type of timber, soil conditions, rate of growth of various tree species, location of possible roads, trails and camps. When complete information is assembled, a permanent plant of forest management will be set up and administered by the company.

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FINANCIAL

Prices on the stock exchange for paper mill securities were not materially changed in August from those prevailing at the end of July. Fluctuations were in most cases merely fractional.

American Writing Paper Corporation—Profit for the half year was $84,198 as compared with $101,650 for the same period in 1943.

Brownville Paper Company—Holders of 2,000 shares of stock are receiving $160 per share as a part of the program to reduce the capital from 5,000 to 3,000 shares.

Certain-teed Products Corporation—Net profit for six months was $210,527 as against $240,676 a year ago.

Champion Paper and Fibre Company—Net profit for the fiscal year ending April 30 was $1,970,527, as compared with $2,532,513 for the previous year.

Continental-Diamond Fibre Company—Net profit for the half year was $173,688 as against $312,956 in 1943.

Crystal Tissue Company—Net profit for the first half year was $41,166, as against $64,537 in 1943.

Dennison Manufacturing Company—Profit for the first half year was $320,000 as against $315,000 for the same period in 1943.

Dixie Cup Company—Net profit for the half year was $952,977 as compared with $899,564 for the same period in 1943.

Eastern Corporation—Net profit for the half year was $250,918 as compared with $155,034 a year ago.

Filer Fibre Company—Net income for the year to May 31 was $68,798 as against $54,542 for the same period in 1943.

Flintkote Company—Net profit for sixteen weeks ending July 15 was $444,190 as against $317,883 for the same period in 1943.

Robert Gair Company, Inc.—Net profit for the six months was $330,320 as compared with $414,410 for the same period in 1943.

Gaylord Container Corporation—Net profit for six months ending June 30 was $522,620 compared with $497,524 for the same period in 1943.

Great Northern Paper Company—Net profit for six months ending June 30 was $941,869 as against $650,793 for the same period in 1943.

Hinde & Dauch Paper Company—Profit for the half year was $606,286 as against $597,192 a year ago.

Hummel-Ross Fibre Corporation—Net earnings for the seven four week periods ending July 8 were $168,425 as compared with $130,348 for the comparable period a year ago.

International Paper Company—Net profit for the second quarter was $1,824,567 as compared with $2,320,083 for the same period in 1943. For the half year the profit was $3,941,273 as compared with $4,343,201 a year ago.

Keyes Fibre Company—Net profit for the first six months of the year was $155,509, an increase of $5,000 over the profit for the same period in 1943.

Kimberly-Clark Corporation—Net profit for the half year was $1,346,110 as against $1,044,690 for the same period in 1943.

Minnesota and Ontario Paper Company—Net profit for the six months was $607,741, as against $722,028 for the same period in 1943.

National Container Corporation—Net profit for six months ending June 30 was $588,865 as against $330,178 for the same period in 1943.

Oxford Paper Company—Net profit for the half year was $429,311 as against $470,353 a year ago, despite an increase in taxes of nearly $400,000.

Puget Sound Pulp & Timber Company—Net profit for the half year was $232,865, as against $228,690 for the same period in 1943.

Scott Paper Company—Net profit for the half year was $645,747 as against $665,247 for the same period in 1943.

Tomahawk Kraft Paper Company—Net profit for the fiscal year ending May 31 was $182,487 as against $135,601 for the previous year.

Union Bag & Paper Corporation—Net profit for the first half year was $795,354, as against $285,787 for the same period in 1943.

United Paperboard Company—Net profit for the fiscal year ending May 31 was $98,983, as against $37,453 for the previous year.

Whitaker Paper Company—Net profit for the half year was $132,585 as against $163,582 for the same period in 1943.

New York Stock Exchange—Stocks

	Closing Prices Aug. 25	July 25
A.P.W. Paper Co.	4⅛	*3¾–3¾
Celotex	14⅛	14½
Same Preferred	*18–18⅜	18¼
Certain-teed Products	6¼	7⅛
Same Preferred	101	96½
Champion P & F Co.	27¾	*26–27
Same Preferred	*112–112¾	*112¼–114
Container Corp.	26¼	26
Cont. Diamond	11⅜	12
Crown Zellerbach	19¾	18¾
Same Preferred	102½	*101¾–102¼
Dixie Vortex	*17½–17⅞	18
Same "A"	47	46⅜
Robert Gair	4½	4¾
Same Preferred	*16½–16⅝	*16¼–16½
Gaylord Container	19⅛	*16½–17
Same Peferred	*52¾–53	*53⅛–54½
International Paper	19⅝	18¼
Same Preferred	82⅞	83
Kimberly-Clark	39	40
McAndrews & Forbes	29⅞	*29¼–29¾
Masonite	44½	43⅜
Mead Corp	11⅜	10¾
Same Preferred	*97½–99	*92–95⅞
National Container	21⅞	22⅞
Paraffine Cos	*55–57½	55⅞
Same Preferred	*105½–110	106
Rayonier	16½	15¾
Same Preferred	31⅜	32⅜
Scott Paper	42⅞	42–42½
Same 4½% Pref.	*111–112	112–113⅜
Same 4% Pref.	*109–110	*109–109½
Sutherland Paper	*32–33¼	*32–33
Union Bag & Paper	12⅝	12
U. S. Gypsum	78½	79¼
Same Preferred	178	179

New York Stock Exchange—Bonds

Abitibi 5%	89½	83¾
Celotex 5¾%	.....	.....
Certain-teed 5½%	102	101¼
Champion P & F Co.	.....	.....
Intenat'l Paper 5%	103¾	104½
Same 6%	108	108

New York Curb Exchange—Stocks

Am. Boxboard	.....	.....
Great Northern	35	34¾
Hummel-Ross	6¾	6¾
St. Regis	6	6
Taggart	5⅞	5¾
United Wall Paper	3⅞	3¼

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I never miss a day
In oiling bearings,
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So give me right of way!

My job is this-
I must not miss
Adjusting clutch and brake.
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not needed more,
But done for safety's sake.

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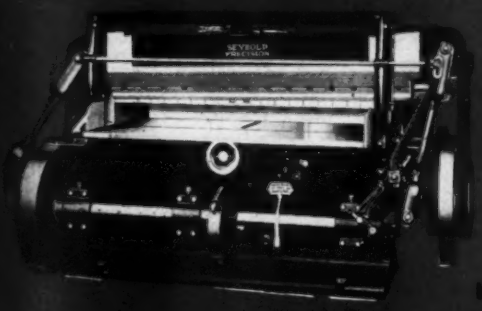
on this here ship
Is to inspect the clamp.
It must be tight
and working right
To keep Seybold the Champ!



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Analysis of Paper and Pulp for First Half of Year

▶▶▶ AN ANALYSIS OF the pulp and paper situation for the first six months of this year has been released by Harold Boeschenstein, acting director of the Forest Products Bureau of the War Production Board. Mr. Boeschenstein stated that military requirements of wood pulp for production of such products as explosives and high tenacity rayon for tires, as well as for overseas packaging and certain special uses, have reached the highest point of the war and are expected to step up in war theaters throughout the world. The following is quoted from Mr. Boeschenstein's release:

"Army and Navy requirements of pulp used in the manufacture of explosives and ammunition will be more than twice as high in the third quarter of 1944 as in the first quarter," he said, "and present estimates are that fourth quarter demands will exceed those of the third quarter."

As a result of the increase in war needs for paper, substantial improvements in pulpwood production and waste paper collections during the first half of 1944 have not been sufficient to balance the demands despite further curtailments by WPB in supplies of paper for civilian uses, Mr. Boeschenstein explained.

Mill receipts of pulpwood through June of this year have been encouraging, he said, but this improvement is not reflected in an equal increase in pulp and paper.

Pulpwood deliveries to the mills during the first half of 1944 totaled approximately 8,369,000 cords. This record was 27 per cent better than the corresponding period of 1943, when pulpwood receipts dipped to their lowest level of the war, but it is four per cent under the first six months of 1942, when pulpwood receipts reached their highest peak in the industry's history.

June receipts of domestically-produced pulpwood continued an upward trend, aggregating 1,336,000 cords, or 37 per cent above June, 1943, and approximately the same as June, 1942. Similarly, the half-year record of domestic pulpwood deliveries showed a 27 per cent improvement over the same period last year, but was slightly under 1942.

By regions, mill receipts were good in June everywhere except in the Northeast, where the inventory situation is still critical. The South reached a new high of 660,000 cords, a 50 per cent rise over June, 1943. (The accompanying table shows pulpwood receipts.)

Reviewing the general pulp and paper situation, Mr. Boeschenstein made the following statement:

"Any change in the present situation, whether it be a drop in production due to adverse weather conditions or a further rise in military requirements, will seriously upset the balance between raw material supply and demand.

"The pulp and paper industry is now operating on a hand-to-mouth basis because of the near depletion of both pulpwood and pulp inventories during the lean production months from the fall of 1942 through the summer of 1943.

"In all regions except the South, pulpwood consuming mills must build up inventories in the summer and early fall to carry them through the winter and bad weather seasons when their receipts drop sharply or stop. Most of those mills at present have no inventory cushions to fall back on if pulpwood deliveries are cut off or curtailed.

"In 1942 and 1943 the pulp and paper industry used 1,700,000 more tons of fibrous materials than were produced in that period and made deep inroads into inventories of pulpwood, pulp, wastepaper, as well as stocks of new paper products.

"An indication of the seriousness of the decline in inventories is shown in the following percentages representing reductions:

Waste paper—from high of 1942 to low of 1943—down 59 per cent.

Wood pulp from high of 1942 to low of 1943—down 56 per cent.

Pulpwood—from third quarter of 1942 to third quarter, 1943—down 28 per cent.

New paper—from high of 1942 to low of 1943—down 26 per cent (wholesale stocks).

"With mill pulpwood receipts approximately equal to the current level of requirements, paper production, without its normal inventory cushion, would drop quickly below actual needs if anything went wrong with future pulpwood production. Any further losses in trucks and tires, without replacements; a drought in the North or prolonged rains in the South; additional drains on manpower by the armed services or war plants, or the recall of prisoners of war, would seriously retard our present paper output.

"Military requirements for paper have been upward for many months and on top of this, the sudden step-up in the tempo of the war is now reflected in overseas demands.

"Every troopship that sails overseas raises the military needs for the paper used in packaging thousands of items of equipment and supplies.

United States Pulpwood Receipts (in cords)

	June		First six months	
	1944	1943	1944	1943
Northeast				
Domestic	179,537	133,433	875,831	805,731
Imported	105,530	96,211	499,096	462,760
Total	285,067	229,644	1,374,927	1,268,491
Lake				
Domestic	115,253	58,824	1,331,286	619,681
Imported	49,545	45,061	179,298	190,806
Total	164,798	103,885	1,510,584	810,487
Appalachian				
Domestic	129,905	91,601	770,541	547,546
Imported	300	....	1,100	700
Total	130,205	91,601	771,641	548,246
South				
Domestic	660,039	439,583	3,398,255	2,880,555
Imported	....	....	....	....
Total	660,039	439,583	3,398,255	2,880,555
Pacific N. W.				
Domestic	251,005	249,907	1,263,302	1,067,886
Imported	14,535	12,962	49,814	33,430
Total	265,540	262,869	1,313,116	1,101,316
Total U. S.				
Domestic	1,335,739	973,348	7,639,215	5,921,399
Imported	169,910	154,234	729,308	687,696
Total	1,505,649	1,127,582	8,368,523	6,609,095

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One of the big reasons for increased productivity of modern machines is speed control. This has been achieved in many cases by means of Reliance Motor-drive—efficiently, directly and eliminating gears, clutches, brakes and other mechanical go-betweens.

Besides control of speed and acceleration, Motor-drive can be the means of reversing, braking, remote control, tension control and tandem operation.

The possibilities of improved machine efficiency with properly applied Motor-drive are very great. Reliance engineers have done some interesting and resultful work in this field. Perhaps a review of them would produce some ideas profitable to you. Just phone or write our nearest office.

A-c power users can now enjoy all the production advantages gained with easy and handy control of operating speeds over wide ranges. These are obtained with the Reliance V★S All-electric Adjustable-speed Drive which connects to the same outlets as your a-c. squirrel-cage motors. For details get Bulletin 311.

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"The wastepaper supply picture, like that of pulpwood, is more encouraging than a year ago, but collections are still well under actual needs, while inventories generally are at a minimum operating level.

"During the first half of 1944 wastepaper receipts at the mills averaged 590,000 tons a month, compared with 505,000 tons a month in 1943. June mill receipts were 597,000 tons. Despite the increase in collections, inventories at the end of June were only slightly higher than at the close of 1943 and were about 250,000 tons under stocks at the end of 1942.

"The wastepaper campaign goal, based on actual needs, is 667,000 tons a month. Thus far, through June the drive is 450,000 tons short of its 1944 objective, and in no month have collections reached the goal set by Donald M. Nelson, Chairman of the War Production Board.

"Even a sudden termination of the European war would not immediately be reflected in a curtailment of mill demands for pulpwood and waste paper.

"Pulpwood production, on the other hand, might be seriously reduced by the withdrawal of prisoners of war from the woods.

"Widely diversified needs for paper and paperboard probably will continue strong after the war, and mills should plan now to be able to meet this demand during the rehabilitation and reconversion period.

"Without attempting to list all members of the teams who have cooperated so patriotically with the WPB in the pulpwood and wastepaper campaigns, including the newspapers, the magazines, the industries, and other Government agencies, I would like to point out that without their aid the paper shortages would have been drastic.

"It is no exaggeration to state that, had these campaigns not been conducted, our current paper production available for civilian uses would have been only half what it is today. And the war effort would have been seriously hampered for lack of certain kinds of pulp and paper materials.

"The current campaigns offer the paper and paperboard industries an excellent opportunity to build up permanent relationships with the producers of their raw material so that adequate supplies will be available for postwar developments."

FORESTRY CAMPAIGN UNDER WAY IN SOUTH

Fifteen million people in the Great Southern Forest Area will be reached during the next few months in an attempt to make the South aware of its forest wealth. This campaign is sponsored by the Forest Farmers Association, the South's co-operative organization of independent timber growers, whose headquarters are in Valdosta, Georgia.

Every lumber man knows how much the income from his lumber mill means to his community. In many cases whole regions derive most of their income from the forest. But even in the average southern community where forest industries are not so prevalent there are about 20 cents in every dollar, or a nickel in every quarter which, on an average, are drawn from the wealth of the woods.

Very few people are aware of this income from the forests. To point out this debt which each individual, from the doctor to the tenant farmer, from the movie owner to the mail carrier, owes to the timber grower and to the wood processing industries is the aim of a Southwide educational program called "Wooden Nickels Campaign," carried on by forest owners of the twelve forest states of the South under the direction of Wayne G. Miller, executive secretary of the Forest Farmers Association.

"Even if you do not own a single tree or a foot of land, still a nickel out of every quarter in your pocket represents wealth created through growing, manufacturing, selling, and using forest products," says Miller. "This is the story we hope to tell through daily and weekly newspapers and radio stations, with exhibits and displays, in group and school programs, at forestry meetings and by personal information. Its main theme is that, since the South derives such a large part of its income from the wealth of the woods, the people of the South must take better care of their forests. The forest farmer and the wood industries do their share. They manage the forest, tend it, and utilize its products in accordance with systematic methods designed to improve, in the long run, the wood resources of the country. It is the duty of 'the man on the street' to do his part by helping prevent woods fires and by reporting any fire that he may notice."

"Ninety-nine out of a hundred forest fires occurring in Florida last year, it was estimated, were started by human hands, either accidentally or willfully. In 1943 forest fires in America cost the South more than forty million dollars. To make an end of this waste of the 'Green Gold of the South,' the 'Wooden Nickels' Campaign of the Forest Farmers Association Co-operative was conceived," states Miller.

BLOCK OF SKENANDOA COMMON STOCK BOUGHT BY ST. REGIS CO.

Announcement that the St. Regis Paper Company, New York, has purchased certain large holdings of Skenandoa Rayon Corporation was made August 24 by Roy K. Ferguson, president of St. Regis.

Out of a total of 343,541 issued shares of common stock of the Skenandoa Corporation, St. Regis purchased a total of 261,589, or more than 75 per cent of the common stock. The board of directors of St. Regis has authorized the making of an offer to purchase all or any part of the remaining shares of the Skenandoa Rayon Corporation from the remaining holders of such stock at the price of $10.00 per share cash. The offer will expire at three o'clock, P. M., September 30, 1944.

The Skenandoa Rayon Corporation was organized in 1925 and began the following year to manufacture rayon yarn by the viscose process at its plant in Utica, New York. The company has approximately 700 employees.

The acquisition of Skenandoa Rayon Corporation by St. Regis Paper Company adds another wood cellulose product to its present lines of business which already include pulps, paper and plastics. Included in the St. Regis Paper Company's postwar plans is the expansion of the Skenandoa productive capacity approximately 20,000,000 pounds annually.

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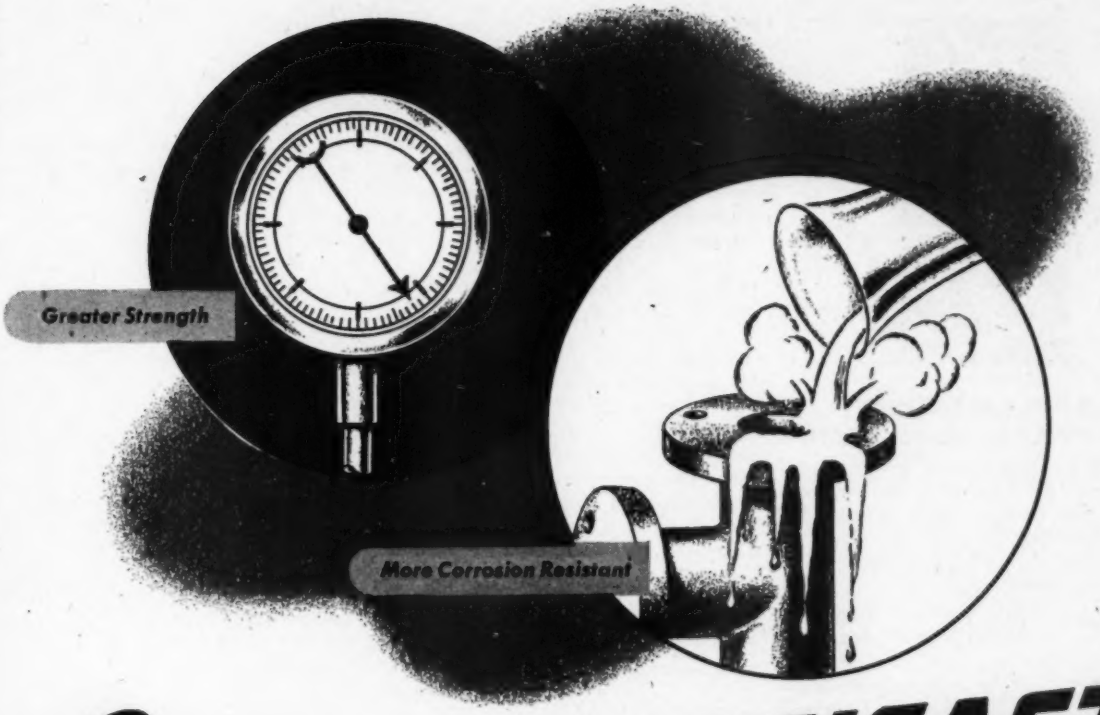
PAPER IMPORTS MAY BE AFFECTED BY CASE OF "POUND STERLING"

A long series of cases involving the conversion of foreign currencies in the computation of duties on imported papers will be affected by a decision of the United States Court of Customs and Patent Appeals, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry. The case in which the decision was rendered involved woolen fabrics from England, but the principle affects shipments of groundwood papers from Canada, papeteries from England as well as other papers. In computing duties, Customs officials have used the official Pound sterling, or the Canadian dollar, and not the so-called "free" pound or dollar. The importer in the woolen case claimed that the "free" pound should have been the basis, thereby reducing the duty paid. The Court in its decision held that the instructions of the Secretary of the Treasury to use the official value of the pound was not subject to judicial inquiry.



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Superior grain refinement makes Cooper stainless castings stronger and more corrosion-resistant. And these important characteristics are secured without altering the chemical composition of standard analyses.

This is but one of many Cooper developments that have helped reduce the cost of casting replacements in sulphite-mill service. Cooper has made castings for the paper industry since 1928. Some of them are still in service. They stand up.

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- X-ray and Gamma-ray inspection.
- Machine shop . . . specially equipped for finishing stainless steel.
- Improved cleaning . . . including Lustrocast electrolytic finishing which leaves all surfaces bright.
- Castings furnished rough, polished or fully machined . . . one ounce to two tons.
- Development of special alloys to meet unusual requirements.
- Technical consulting service.

WOOD PULP INDUSTRY ADVISORY COMMITTEE

Twelve business men, representing large and small producing firms in the wood pulp industry, were appointed last month by the OPA to serve as the Wood Pulp Industry Advisory Committee to OPA.

This committee will consult with and advise OPA on matters of price policy in connection with all grades of wood pulp sold on the open market, and particularly with respect to Maximum Price Regulation No. 114 (wood pulp) which establishes ceiling prices for the industry.

Although most of the committee members have headquarters in New York City, all areas of the country producing and selling wood pulp are represented by the committee. The members appointed are:

Amor Hollingsworth, president Penobscot Chemical Fibre Company, Boston.

L. K. Larson, manager of sales, Weyerhaeuser Timber Company, Longview, Wash.

S. B. Copeland, president Northwest Paper Co., Cloquet, Minn.

*S. E. Kay, manager Manufacturing Dept., International Paper Co.

*R. M. Buckley, eastern representative, Soundview Pulp Co.

*A. W. Berggrem, asst. to vice president, Rayonier, Inc.

*W. J. Dixon, vice president and secretary, St. Regis Paper Co.

*D. S. Leslie, 1st vice president and asst. general manager, Hammermill Paper Co.

*J. L. Madden, vice president, Hollingsworth & Whitney Co.

*R. W. Hovey, vice president, Oxford Paper Co.

*D. L. Luke, Jr., vice president, West Virginia Pulp & Paper Co.

*D. P. Brown, asst. to general sales manager, Brown Co.

(*) All with headquarters in New York City.

▶▶▶ THE AMERICAN LEGION swung into action in support of the national wastepaper collection drive during the two-week house-to-house canvass which was launched September 3 to run through the 16th. The Legion conducted the campaign in honor of service men, climaxing the drive with an Honor Roll Day in each community.

▶▶▶ THE TREASURY DEPARTMENT announces the appointment of C. A. Dickerson as director of Paper and Paper Products Unit of the Office of Surplus Property in the Procurement Division of the U. S. Treasury Department. Mr. Dickerson is president and treasurer of the Sabin Robbins Paper Company, Cincinnati, Ohio. He is a member of the Post War Planning Committee of the National Paper Trade Association.

▶▶▶ CEILING PRICES on pulpwood imported from the Canadian Provinces of Quebec, New Brunswick and Nova Scotia were revised by the Office of Price Administration on August 17 to bring them into line with changes made by the Dominion Government in the ceiling prices in Canada for this pulpwood. These changes, which were effective August 26, mean that the United States mills will pay 25 cents per cord more on rough and 50 cents per cord more on peeled spruce and jack pine pulpwood than they paid previously.

▶▶▶ JAMES HALE STEINMAN, newspaper publisher of Lancaster, Pennsylvania, has been appointed director of the Printing and Publishing Division, according to an announcement by Harold Boeschenstein, acting director of the WPB Forest Products Bureau. Mr. Steinman succeeds Arthur R. Treanor, who resigned August 5; his appointment is retroactive to that date.

WPB ADMINISTRATIVE CHANGES MAY CAUSE SERVICE LIMITATION

A radical change in the administration of the War Production Board has been announced in an amendment to the general order governing its operations, under which the first steps are taken to eliminate experienced business men from the key positions in the Board and to supplant them with professional Government employees. The order accomplishes this objective by imposing rigid new limitations on the type of men who will be permitted to serve the Government in the capacity of dollar-a-year men, conditions which will not only limit future employment of such business executives but will doubtless cause the retirement of many talented men now giving their services to their country. Many implications can be read into this new policy, but a casual interpretation may sustain the complaint made by some of the top-flight business men who have recently retired from the board that internal sniping by underlings has hamstrung the ability of experienced business leaders to get results. Several restrictions are placed on the employment of such men, not the least being to bar any business men from passing on any case affecting any part of the industry which he is affiliated with. Hitherto such men could not pass on action affecting their own companies, but under the new order they can not pass on action affecting their competitors as well. This would mean that business men whose knowledge of a specific industry has been given to the government will no longer be able to serve in any capacity affecting the industry with which they are best familiar.

CHRISTMAS IS COMING!

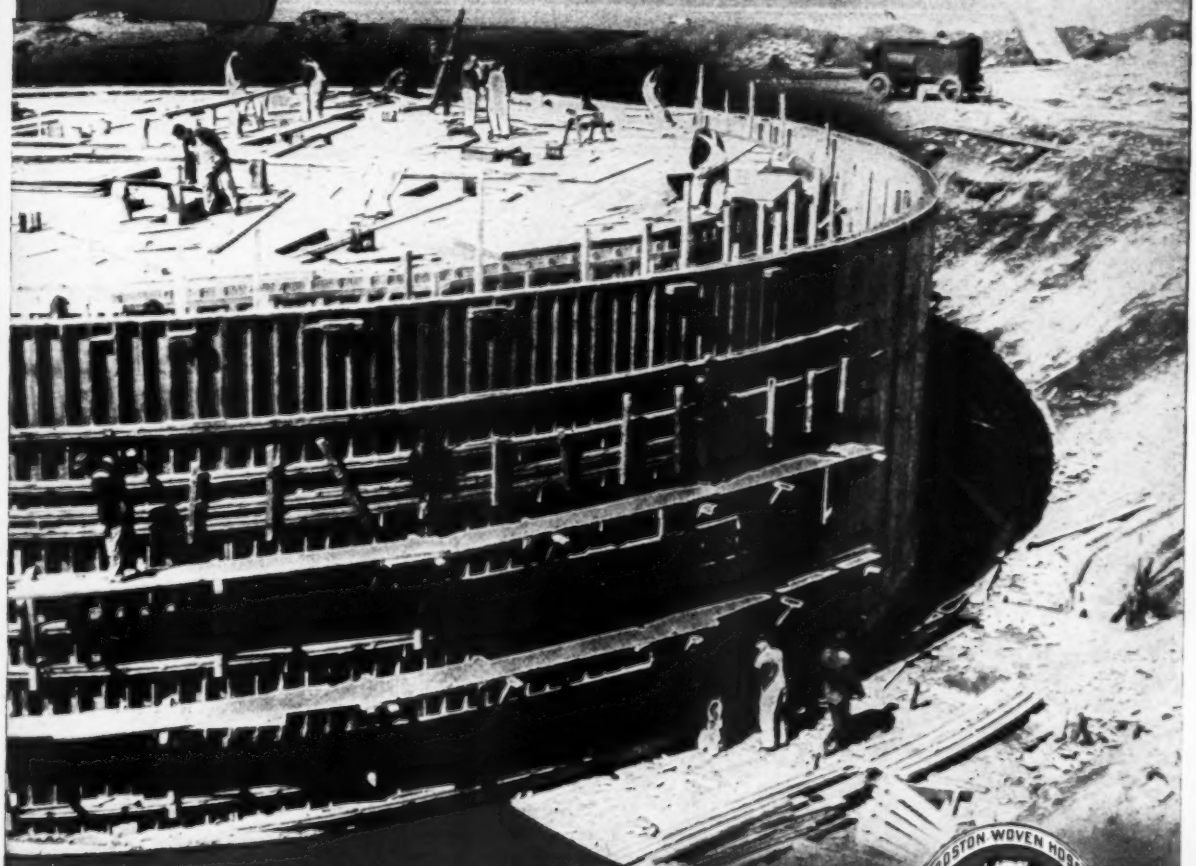
Don't forget that Christmas packages for the boys in the Armed Forces must be mailed between September 15 and October 15—the earlier the better. Packing cases are available that meet the standard requirements, and there will be a large assortment of "goodies" already packed for shipment. Boxes should not weigh over five pounds packed, nor should the package measure more than 15 inches in length.

IT HAD TO BE DONE ...AND WE DID IT!

Early in 1940 the Navy Department began to visualize a possible shortage of steel plate. Reinforced concrete tanks for fuel storage were suggested if they could be so lined as to prevent seepage of the gasoline.

BWH engineers solved the problem by lining the tanks with a thin sheet of synthetic rubber, covering walls, floors and columns like wall paper. This not only prevented seepage but protected the gasoline from a drop in octane rating.

Another example of BWH ingenuity and resourcefulness in applying rubber to a difficult problem.



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WORKS: CAMBRIDGE, MASS., U.S.A. P.O. BOX 1071, BOSTON 3, MASS., U.S.A.

POSTWAR TECHNOLOGY DISCUSSED BY DR. LEWIS

Many startling developments in the fields of science will be revealed in the postwar world, Dr. Harry F. Lewis, dean of the Institute of Paper Chemistry told students of Lawrence College in a recent talk in Memorial Chapel.

Speaking on "Technology in the Postwar World," Dr. Lewis said that many unbelievable developments have been brought about by the necessities of war, a majority of which are not known to the public. The effect of the war on certain areas of scientific knowledge has been tremendous, and although some hold the opinion that the effect has not been entirely beneficial, most authorities predict a great postwar future in the application of these developments to civilian life.

The speaker briefly compared the scientific aspects of the two world wars and stated that the co-operative research program now in effect is greater than ever believed possible. The last war developed the chemical industry, he said. This war has enlarged the importance of physics and mathematics.

Dr. Lewis gave many examples of war demanded developments and showed several samples of products now in use. As a sample of co-operative research the dean called attention to the penicillin industry, where the output now is far ahead of the original schedule. In normal times it would have taken years to develop such a discovery, he said.

In facing shortages brought about by the demands of the war, including the vast lend lease program, the scientists have developed many a substitute and there is no let-up in the search. Among the items mentioned by the dean as being investigated are solar heating, synthetic diamonds for cutting, liquid heating, food from oily fish, and numerous laminated paper products. The latter include a paper house, now practically a reality.

Among the samples of products now being manufactured which were shown by Dr. Lewis, were a section of a laminated paper I-beam, a portion of an airplane fuselage, also made entirely of laminated paper base plastic, a six volt storage battery held in the palm of his hand, and numerous paper containers developed for war shipments. These latter included the box designed for beach landings where they are thrown overboard and are carried ashore by the tide. Postwar food containers made similarly are being tested with excellent results. Dr. Lewis stated that the whole container field is in for a state of evolution. Paper gas masks, organic glass, and synthetic fibers were also shown to the students. The latter included bark fibers excellent for mattress and overcoat material.

A large bag full of milk weed floss, weighing about 4 pounds was tossed around by the speaker. Ten million pounds of this is being produced as a substitute for kapok for life preservers.

Dr. Lewis, in calling attention to what fields his listeners might interest themselves, quoted a survey taken among 200 scientists and educators recently. The fields which the majority of these men predict to be the most fertile are in rank order: aviation, radio and electronics, plastics, housing, alloys and the metal industry, food processing, synthetic rubber, chemical engineering, and automobiles.

GI Joe to Get Extra Comforts with "C" Ration

An accessory packet containing cigarettes, matches, gum, toilet tissue, water purification tablets and a small folding tool-steel can-opener just fits the interstices between center sections of a case of 48 cans of "C" ration. Major James d'A. Clark, staff officer of the Packaging Branch of the Quartermaster Corps Subsistence Research & Development Laboratory located at the Chicago Quartermaster Depot (shown above) is responsible for the new development. At left, Lt. Robert Couch, assistant in the Packaging Branch of the Quartermaster Corps, shows how these accessory packets are inserted.

◆

▸▸▸ A PULP MILL in the Prince George area is to be built by the Eagle Lake Sawmills Ltd., of Giscome, British Columbia, according to a report attributed to W. B. Miller, president of the company. The plant will cost over $3,000,000; it will have a capacity of 200 tons daily and construction will begin as soon as equipment is available, which probably will be not until after the war.

◆

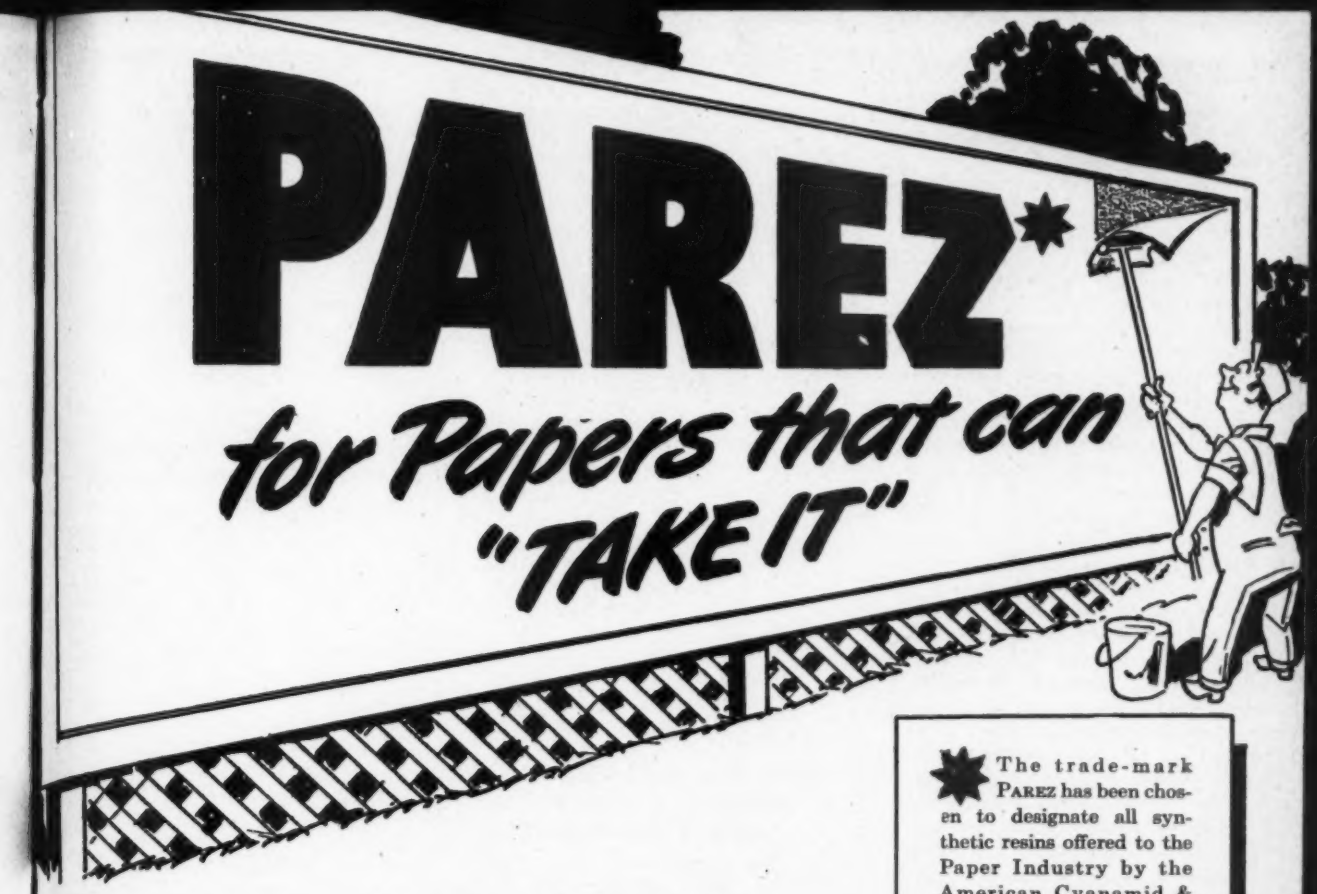
WOOD EXPERTS TO MEET AT SYRACUSE

A conference on new development in wood products will be held at the New York State College of Forestry, Syracuse University, October 6 and 7, according to an announcement by Chancellor William P. Tolley of the University. This will be a gathering of experts from wood-using industries, research institutions, the Army and the Navy who are engaged in the production or use of new wood products to meet the demands of war and are now planning for the postwar period.

Dr. Joseph S. Illick, acting dean of the New York State College of Forestry, states that the program now being prepared will include exhibits and demonstrations of recent developments in the field of wood products. It will also include talks and papers on out-

PAREZ*

for Papers that can "TAKE IT"



The trade-mark PAREZ has been chosen to designate all synthetic resins offered to the Paper Industry by the American Cyanamid & Chemical Corporation. This family of products includes our well-known wet strength resin derived from melamine. This same resin is now known as PAREZ 607.

PAREZ Is New Name for Cyanamid's Well-Known Wet Strength Paper Resins

Bringing lasting wet strength qualities to paper has proven to be one of Cyanamid's most important and timely contributions to wartime industrial development. The "secret" ...a special type of resin bonds paper pulp fibers together in such a way that they resist separation when exposed to water on aqueous material.

Most of the developments in the use of PAREZ have been accelerated and absorbed by military considerations. These many and varied war-proven uses will, with peace, serve as the basis for the development of new paper product applications for civilian goods in which wet strength qualities will provide sales appeal advantages. Listed here are some of the applications for wet strength qualities in paper:

- Grocery and Shopping Bags
- Multiwall Shipping Bags for Heavy Duty
- Cartons and Carton Liners
- Liners for Crates and Barrels (plain and laminated)
- Moist-Product Containers (frozen foods, potatoes)
- Shipping Labels and Tags
- "Wet-Scuff" Resistant Boxes and Bags
- Maps and Blueprint Papers
- Photographs
- Direct Process Prints
- Towels, Facial Tissues and Handkerchiefs
- Hanging Papers
- Twisting Papers
- Inner & outer plies only of paper board for use under moist conditions
- Papers for dry use where maximum fold is required
- Thin papers where good sizing is difficult
- Wipers replacing rags
- Outdoor Advertising
- Papers exhibiting minimum dimensional change with humidity variations.

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standing achievements in their production by research institutions and the industries. Many of these new services of wood have contributed to the progress of the war and will materially benefit the social and business life of the future.

Dr. Illick says the conference will be concerned not only with these new materials of the mechanical and the chemical laboratories but with further refinements in serviceable wood products through research. Special demonstrations at the conference will indicate the possibilities of important future developments in the use of wood products.

Many of the leading wood-products industries will install and operate exhibits. These exhibits will be set up in the rotunda of Bray Hall and the library reading room of the Marshall Memorial Building. Committees have been organized and are now working on the program of speakers, the display of exhibits and the accommodations for representatives of the industries and Government agencies who will attend the conference.

The conference will emphasize developments in wood plastics, the use of synthetic resins in the glueing and laminating of wood, the use of electronics in the drying and laminating of wood and fire-resistant treatment of wood. A feature of the conference will be the inspection of the College pulp and paper mill in operation and a review of research projects in progress at the plant.

◆

BRAZIL'S PAPER INDUSTRY

The war has diminished Brazil's foreign sources of paper pulp considerably, but despite restricted imports of raw materials, paper manufacturers were able to increase their output by more than 170 per cent during the 5-year period 1938-43.

Most of the increase was made possible by the successful utilization of such native raw materials as pine, fibrous plants of various kinds, cotton linters, and rice straw. It is understood that a new enterprise at Manaos contemplates making pulp and paper from the residue of jute after the fiber has been removed.

A number of new pulp and paper concerns have been established in Brazil and others are planned. Because of the present difficulties in securing machinery from abroad, a large part of the equipment for these new plants is being manufactured locally.

Still under construction is the large chemical-pulp and newsprint mill at Tibagy in the State of Parana. This mill, work on which was begun more than 3 years ago, will be the largest of its kind in South America. Repeated delays have been brought about by the war, but it is reported that the plant is now far enough advanced that even if actual operations must be delayed until after the war (because of the inability to procure some of the required machinery), it will be in a position to start up in the immediate post-war period. Plans call for an annual production of 40,000 tons of newsprint, 40,000 tons of chemical wood pulp and 45,000 tons of mechanical pulp from native Parana pine, which amount is expected to satisfy a large part of Brazil's requirements of these items.

Production of cellophane (understood not to be thoroughly moisture-proof) was begun recently in Brazil. The new plant, the only one of its kind in Brazil, is equipped with domestically manufactured machinery and has an estimated daily capacity of 1 ton. *(Foreign Commerce Weekly)*

◆

UNION BAG & PAPER CONTRACT GOES TO RUST ENGINEERING

In connection with the 1944-45 expansion program of the Union Bag and Paper Corporation, Savannah, Georgia, announcement is made that the contract for design and construction of a new high pressure steam plant, new power generating station and other auxiliary work has been awarded to The Rust Engineering Company, Pittsburgh, Pennsylvania, and Birmingham, Alabama.

This project will cost approximately $1,500,000 and will include alterations and modernizations of the company's existing steam and power generating facilities at Savannah.

◆

EXPANSION OF POWELL RIVER CO. TO BRING DIVERSIFICATION

In addition to the diversification and the expansion of paper mill processes at the plant as part of the $13,000,000 postwar expansion program of the Powell River Company at Powell River, British Columbia, the company's plans also call for the manufacture of by-products from waste material. According to a recent statement by H. I. Andrews, control superintendent and research director, the program of expansion should be spread over a four to five year period and waste material being produced would lead, among other things, to the production of yeast, and the recovery of sulphur and potential fuel at present being wasted in sulphite liquor. Production of tanning material from bark, and production of plastics for various commercial purposes are also included in the expansion program.

As part of this same program, the company proposes to install new hydraulic log barkers of the same type as is now in operation at the pulp mill of the Weyerhaeuser Company, Everett, Washington.

◆

MILLS ON PAC. COAST ORGANIZE A STANDING INDUSTRY COMMITTEE

Representatives of the pulp, paper and paperboard industries of Washington, Oregon, and California organized a standing industry committee for the Pacific Coast at a meeting in Seattle late in August. The committee, working with similar groups representing other parts of the United States, will play an important part in aiding the work of the National Council for Stream Improvement which is undertaking a broad program of research into waste utilization and disposal problems.

Chairman of this committee is R. S. Wertheimer, manager of Longview Fibre Company, Longview, Washington. Erik Ekholm, representing the Puget Sound Pulp and Timber Company, Bellingham, Washington, was made vice chairman. These men will represent the mills in the region in council affairs.

◆

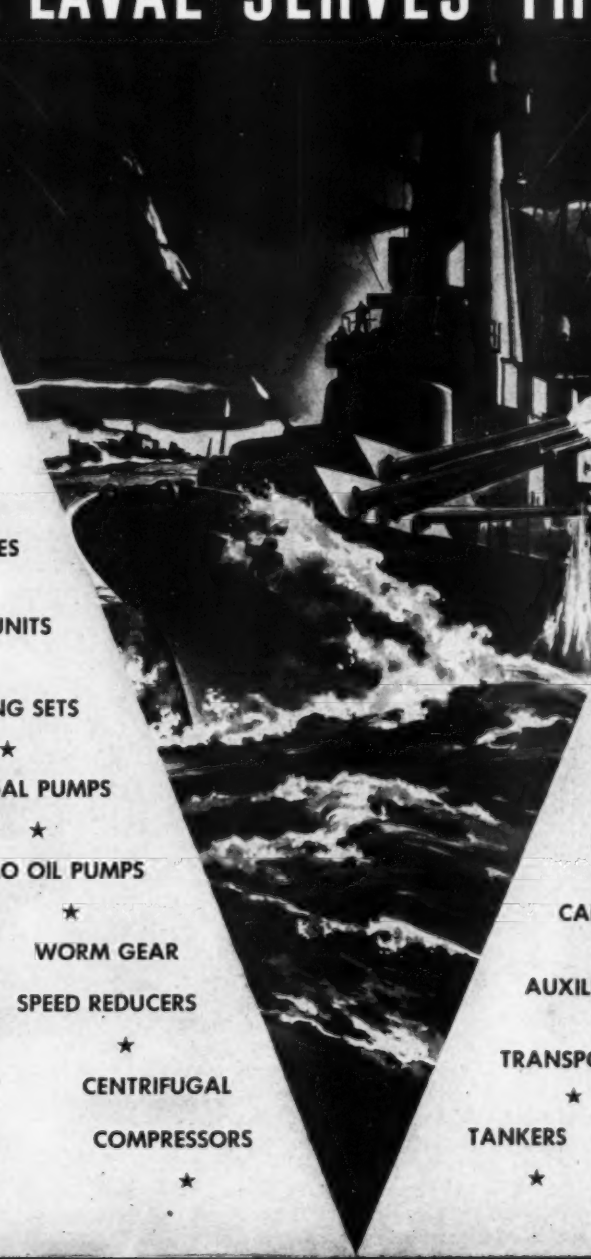
CANADA CONSIDERS A MINISTRY OF FORESTRY

From time to time the suggestion has been put forward that a Ministry of Forestry, Pulp and Paper should be established by the federal government along the lines of the present ministries for agriculture and for fisheries. New point has been given to this suggestion by George E. Graham, of Kentville, N. S., vice president of the Canadian Forestry Association, who, in an address in Halifax, pointed out that while there were plans by provincial governments to build many hundreds of permanent highways to help unemployment after the war, little is heard about commitments for rebuilding the forests of the country.

One of the main stumbling blocks to the setting up of such a Ministry is the fact that 90 per cent of the forest lands in Canada are the property of the provinces, to which they are an important source of revenue, and the provinces are intensely jealous of any outside interference in respect to these holdings. On the other hand, the forestry industries provide Canada's most

...through the years

DE LAVAL SERVES THE NAVY



REDUCTION GEARS ★ TURBINES ★ PROPULSION UNITS ★ GENERATING SETS ★ CENTRIFUGAL PUMPS ★ IMO OIL PUMPS ★ WORM GEAR SPEED REDUCERS ★ CENTRIFUGAL COMPRESSORS ★

BATTLESHIPS ★ AIRCRAFT CARRIERS ★ CRUISERS ★ DESTROYERS ★ DESTROYER ESCORTS ★ SUBMARINES ★ CARGO SHIPS ★ AUXILIARY SHIPS ★ TRANSPORTS ★ TANKERS ★

M-43

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

De Laval

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important lines of exports. In fact, in normal times the pulp and paper industry is the mainstay of Canada's position in respect to foreign exchange. Such supervision as there is in the federal field comes under several ministries, notably the Department of Mines and Resources and the Department of Trade and Commerce. Men in the industry who are interested in promoting a sound postwar program for future development report that in attempts to further the program, they are referred back and forth from one department to another, and that no one appears interested enough to assume responsibility. They point out that apart from problems connected with marketing abroad, there are many questions of the highest importance that demand unified action such as the provinces separately cannot supply—such, for instance, as fire and insect pests and the lack of a national policy for scientific control designed to treat the forests on an annual crop basis rather than "mine" them as is too often the cast at present. This matter is likely to be brought up at a forthcoming Dominion-Provincial conference.

◆

▶▶▶ AN OPINION WAS FILED in the Federal District Court on August 16 which terminated a suit filed December 7, 1938. The plaintiff, Judson A. De Cew, of Process Engineers, New York City, charged that the Union Bag & Paper Company, Hudson Falls, New York, was employing methods patented by the plaintiff without securing his permission. The opinion given in the case was that the Union Bag & Paper Company was not guilty of infringement upon two patents for paper manufacture due to the ruling that the patents were invalid.

◆

HORN WASTE FOR PLASTICS?

The possible utilization in India of horn waste as a raw material for the plastics industry has been investigated by the Scientific and Industrial Research Council, according to the British press.

One of the products developed is said to possess unusually good physical and mechanical properties. The process is being exploited on a commercial scale by a concern in South India.

Horn waste is available in India in large quantities as a byproduct of numerous cottage industries making butons, combs, umbrella handles, and other articles. *(Foreign Commerce Weekly)*

▶▶▶ THE POSTWAR BUILDING program of the St. Regis Paper Company, Longview, Washington, is the largest yet announced for the Tacoma area. The company is planning a paper mill and bag plant to augment present facilities, with an estimated expenditure of $3,000,000. Total postwar projects planned for Tacoma now total $13,000,000.

◆

▶▶▶ A GOVERNMENT BODY to be called the Ontario Forest Resources Commission was forecast by provincial premier, George Drew, recently in an address to citizens of the Nipigon district. Personnel of the Commission will be named shortly, and will direct, in addition to actual forest administration, an educational program which will include the use of motion pictures to impress upon school children the effects of carelessness in the forest. This organization will follow the examples of Finland, Norway, and Sweden.

◆

RECENT WAR DEMANDS MAKE SHORTAGE OF PAPER MORE CRITICAL

Repeated warnings of a tightening available supply of paper for civilian needs have been issued during the month by Washington authorities. A large part of the problem is due to the fact that the tremendous bombing by American air forces, and the incredibly heavy artillery operations by ground troops have called for a larger volume of explosives, and in turn for the diversion of increasing quantities of pulp from paper manufacture to ammunition production. Military demands for paper itself have steadily increased, causing increasing shortages in the amount available for civilian uses. There has been some criticism of paper mills for failure to accept Government contracts, and while 90 per cent of the industry is taking all Government orders offered, the 10 per cent remaining is charged to the industry as a whole in the minds of many Washington officials. The threat has been made that unless Government orders are universally accepted all paper sales may be channeled through the use of priority procedure, a development feared by both Government and industrial people. Some of the complaints, according to industry representatives, are due to a failure to understand mill procedure. For instance, a mill may be called upon to provide the Government with more of a given type of paper in sheets than its converting equipment can handle. This situation has been met in many cases by cooperation between mills with roll stock available, and converters with sheeting equipment not in full use.

The wastepaper situation has complicated matters, collections not being up to mill requirements in many cases. This, of course, affects the board mills primarily. A recent survey of the New York area situation showed that many of the big board mills in that region are unable to operate to normal capacity because of lack of this vital raw material.

◆

WORK STARTED ON K-C PLANT AT KAPUSKASING

It is reported that contracts have been let and work is under way on the new $1,250,000 mill at Kapuskasing, Ontario, for Kimberly-Clark Corporation of Canada. This plant will handle the processing of crepe wadding and will provide work for 250 persons.

At present, twenty-five houses are being erected. The mill which it is expected will be completed in November, will carry out in Canada a phase of the company's operation previously operated in the United States.

◆

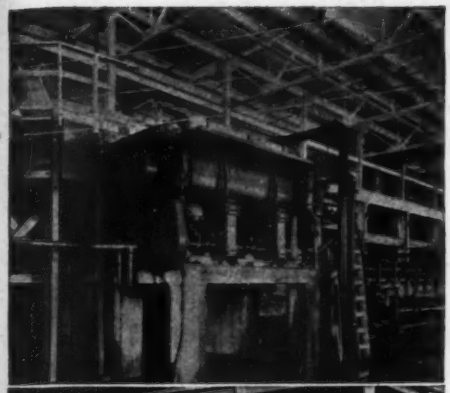
▶▶▶ OPERATORS MUST USE their own ingenuity to keep the pulpwood supply at its present level, is the verdict of the West Coast Pulpwood Industry Advisory Committee. It is further asserted that neither the War Production Board nor the War Manpower Commission can promise relief in either tire or labor shortages. James L. Madden, deputy director of the WPB Paper Division congratulated the West Coast mills on "their resourcefulness and ingenuity in increasing their production and inventory with less manpower than they had a year ago."

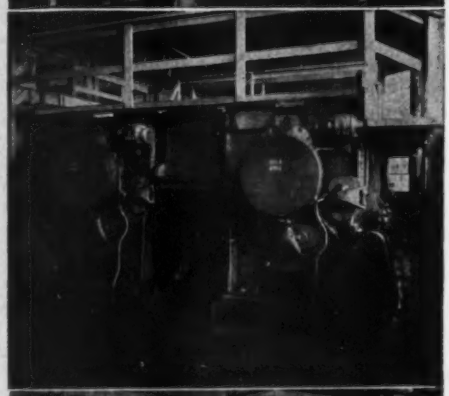
◆

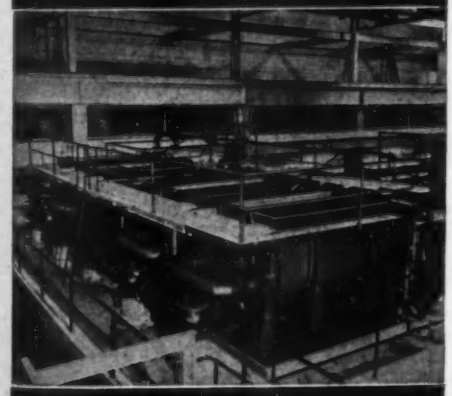
CELLULOSE IN SWEDEN

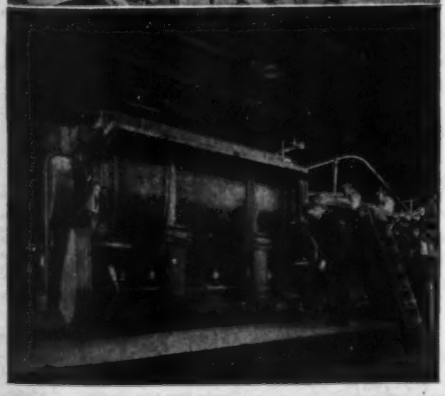
A report from the American-Swedish News Exchange, Inc., New York City, states that in Sweden during 1944 around 200,000 tons of cellulose have been manufactured for postwar consumption. In 1943, the Swedish pulp mills used only 35 per cent of their capacity, and about one-third of this small production was cellulose feed. The new year did not bring any prospects that the export sales of cellulose would soon increase.

In the Swedish-German trade treaty that was signed in January, 1944, the Swedish export quota for wood pulp was fixed at 200,000 tons, which was less than a tenth of the normal Swedish exports of cellulose before the war.









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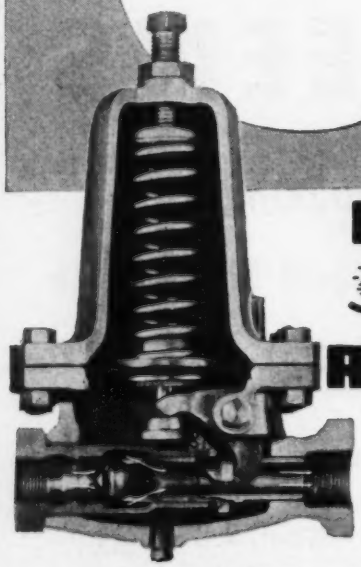
NO SPOILAGE



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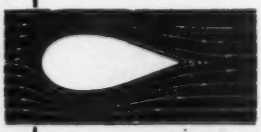
The "1000" valve is single seated and its valve makes line contact with its seat ring which accounts for its tight closing characteristics. The unusually long diaphragm spring insures sensitive pressure control.

Steam, water, air, oil, etc. flow through this valve in a straight line—nothing is in the path of flow to cause turbulence — therefore, peak flow is never a problem.

TURBULENCE LIKE THIS *Eliminated*

YOU GET THIS *Streamlined* PATTERN



The inner valve is streamlined — no back eddies to hinder flow — valuable when you want all possible fluid to go through the valve to meet peak demand.

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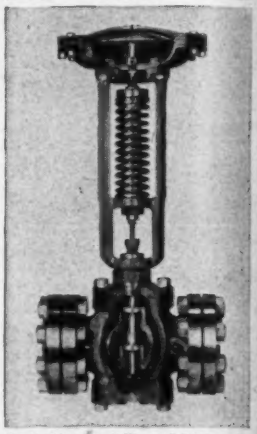
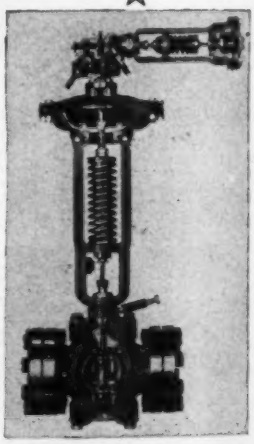
DECATUR, ILLINOIS

OTHER VALVES *from the* CASH STANDARD LINE



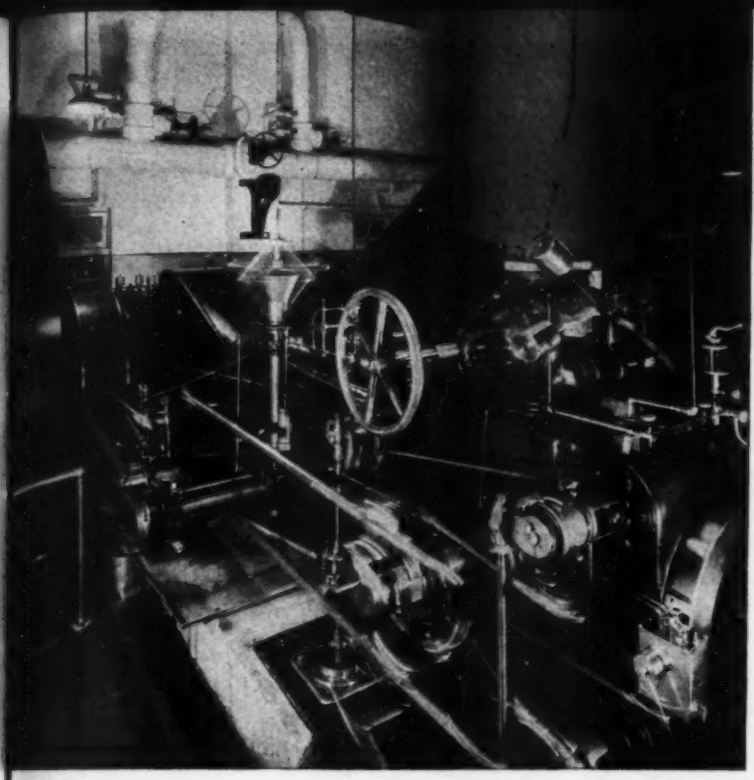
Cash Standard Type 34 Pressure Reducing Valve. For practically all fluids. Has roller bearing, also roller guides that kill side strains and stop packing trouble —no lost motion.

Sizes: ½" to 12" inclusive. Highest initial pressure 800 lbs.; reduced pressure vacuum to 150 lbs. Bodies: iron, bronze, steel. Trim: iron, bronze, stainless steel. Ends: screwed, flanged, ammonia type, welding type. Bulletin 968.



Cash Standard Type 30-AP Valve gives precise control of fluid pressures, through a pilot connected to the pressure under control. For steam, water, air, and most fluids.

Can be a pressure reducing valve or a back pressure valve depending on the way the control lines are connected. Pressures up to 600 lbs. Sizes ½" to 12" screwed; 1" to 12" flanged ends; wide variety of metals.



Picture of an engine helping win a war

• STEADY, driving power to feed the machines . . . that build tanks and guns . . . the steel they're made of . . . the ships that carry them and the ammunition and men to man them. Can you see all that in the flashing rods and spinning wheels pictured above? They are all there because every kw. of uninterrupted power produced adds its mite to the might of the men at the front.

Uninterrupted power—that's what's important—no time out for replacing worn valves or parts, reboring cylinders or even cleaning quills.

That's where good lubrication can help. New Stanocyl is a made-to-order answer to wartime steam cylinder lubrication. Read the advantages it offers. Ask a Standard Lubrication Engineer to recommend the grade you need to keep your plant "on the line" for the duration—and longer. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha 2.

Gasoline Powers the Attack . . .
Don't Waste a Drop!

New Stanocyl keeps war-worked engines cleaner

1. Less deposits. New Stanocyl contains a combination detergent and oxidation inhibitor in addition to special steam cylinder oil compounding. This inhibitor reduces oxidation of the oil at high temperatures—one frequent cause of deposit formation. The detergent action helps keep deposits—either oxidized oil or foreign matter—from settling out at points of low steam velocities. These potential deposit-formers are carried through the engine and are easily removed from the exhaust steam.

2. Less wear. New Stanocyl atomizes readily even in the heaviest grades. This means that a heavier grade than would normally be used can be applied to keep wear and consumption to a minimum. New Stanocyl has unusual wetting abilities. It adheres to cylinder walls and replaces any water present. It also resists the washing action of water such as is encountered in unusually wet steam. These factors contribute to more effective lubrication.

3. Cleaner exhaust steam. New Stanocyl assures greater freedom from oil carryover in the exhaust steam. The low oil feed required for good lubrication reduces the oil removal burden usually imposed on the separators. In turn, this cuts down on the amount of time required to service oil separators.

4. An all-purpose cylinder oil. New Stanocyl is made in three grades. Two grades, W and SH, are available for special operating conditions. Stanocyl D is an all-purpose steam cylinder oil. This one oil will usually handle the cylinder lubrication requirements of a wide variety of engines in a plant. It will lubricate both high and low pressure cylinders of compound engines. Stanocyls have given excellent satisfaction at steam pressures ranging from 100 pounds saturated steam to 250 pounds with 100°F. superheat.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

LUBRICATION ENGINEERING • • LUBRICATION ENGINEERING • • LUBRICATION ENGINEERING • • LUBRICATI

FROM GEON resins may be made a wide variety of thermoplastic elastomers that can be used as coatings for papers, calendered or cast into film and sheet, pressure or injection molded, punched or extruded—all at low cost on standard machinery. Or in other forms, GEON may be used as a sizing, ink or paint. The number of applications yet to be discovered seems limitless.

Here is a list of properties which may be found in GEON and GEON treated materials in a wide variety of combinations:

Flexible
Waterproof
Spongeable
Lightweight
Odorless
Increased tear resistance
Increased tensile strength
Easily embossed
Wide range of colors and luster
Can be heat-sealed

Resistant to

Acids
Alkalies
Chemicals
Oil
Foods
Creasing
Flame
Mildew
Spots and stains
Sticking
Light
Aging
Cold
Heat

This impressive list should suggest innumerable applications for GEON in the packaging and paper fields. Our research staff and laboratory facilities are available to help you work out any special problems or applications.

★ ★ ★

For answers to your questions or for help on specific problems write

Dept. M-2 CHEMICAL DIVISION
The B. F. Goodrich Company
ROSE BUILDING E. NINTH AND PROSPECT
CLEVELAND 15, OHIO

GEON is available to industrial users subject to allocation under General Preference Order M-10. Limited quantities can be had for experiment

"It does flow south to the Gulf!"

Joliet and Marquette—unforgettable names in the bright pages of early Americana. Leading a band of only five men, they pitted their indomitable will against the perils of the unknown. Fighting their way through forest and swamp, paddling over raging rivers, they finally reached the confluence of the Mississippi and Arkansas. Here they knew beyond doubt that the mighty "Father of Waters" flowed to the Gulf of Mexico. Progress followed after them—forts, settlements, breaking of the unknown wilderness. Again "two hands, two minds, proved better than one." Again teamwork won the day!

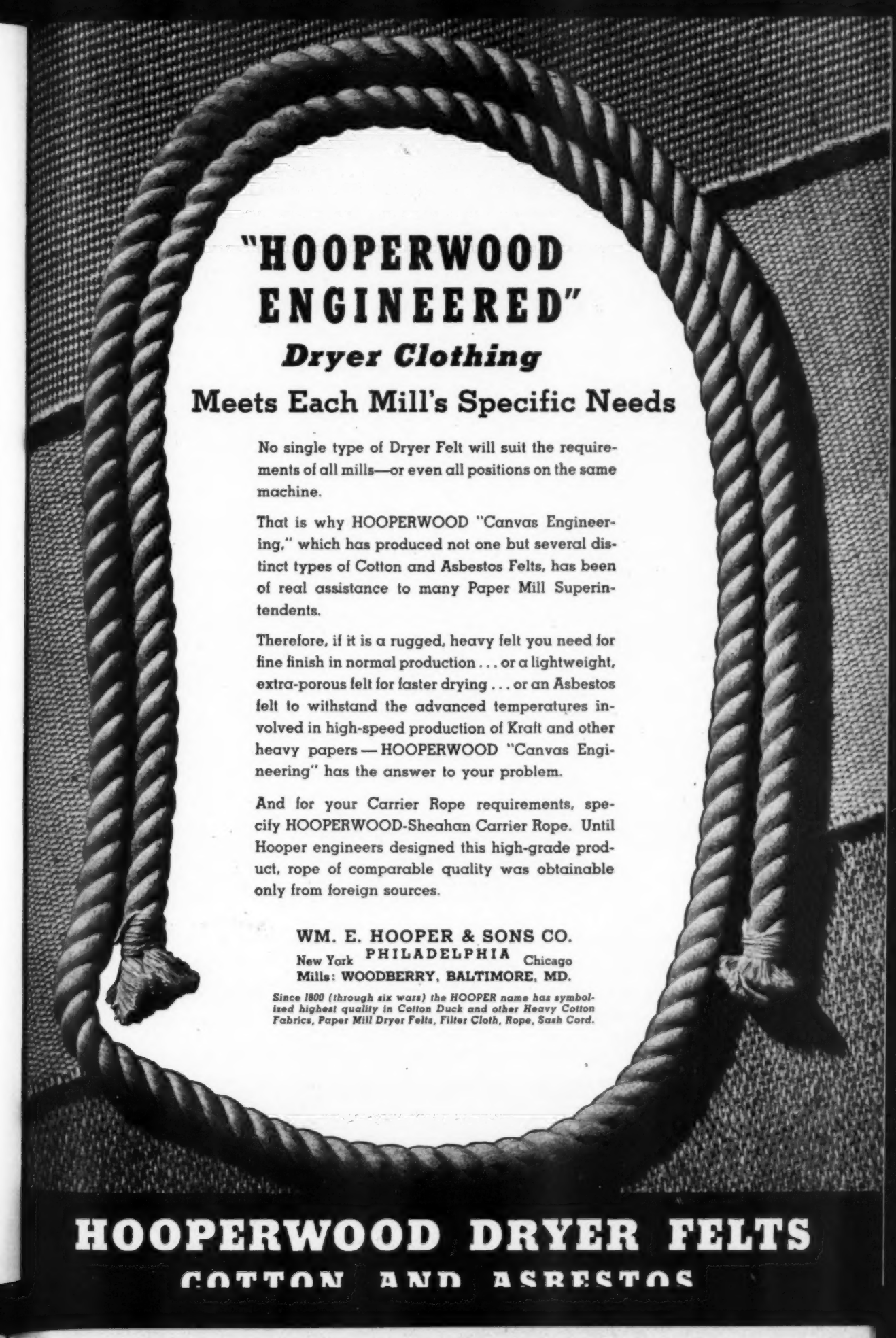
Teamwork Makes Better Paper, Too

If teamwork means "working together toward a common end," then the Bevis organization has what you will need to improve your equipment and mill operations after the war.

No doubt you have some ideas about things you want to do to produce better and more profitable papers. Pooling your ideas and experience with ours is sure to result in greater efficiencies and cost-savings all along the line. You'll want your equipment in tip-top condition for the years of competition ahead.

While we are working on war orders almost 100 per cent, we still find time to think about your future problems—generating ideas that will help you reduce mill costs, speed operations, improve paper quality, and step up profits. Then as now the Bevis aim will be "Better Teamwork for Better Results."

THE BEVIS MACHINE COMPANY, MIDDLETOWN, OHIO



"HOOPERWOOD ENGINEERED"

Dryer Clothing

Meets Each Mill's Specific Needs

No single type of Dryer Felt will suit the requirements of all mills—or even all positions on the same machine.

That is why HOOPERWOOD "Canvas Engineering," which has produced not one but several distinct types of Cotton and Asbestos Felts, has been of real assistance to many Paper Mill Superintendents.

Therefore, if it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers — HOOPERWOOD "Canvas Engineering" has the answer to your problem.

And for your Carrier Rope requirements, specify HOOPERWOOD-Sheahan Carrier Rope. Until Hooper engineers designed this high-grade product, rope of comparable quality was obtainable only from foreign sources.

WM. E. HOOPER & SONS CO.

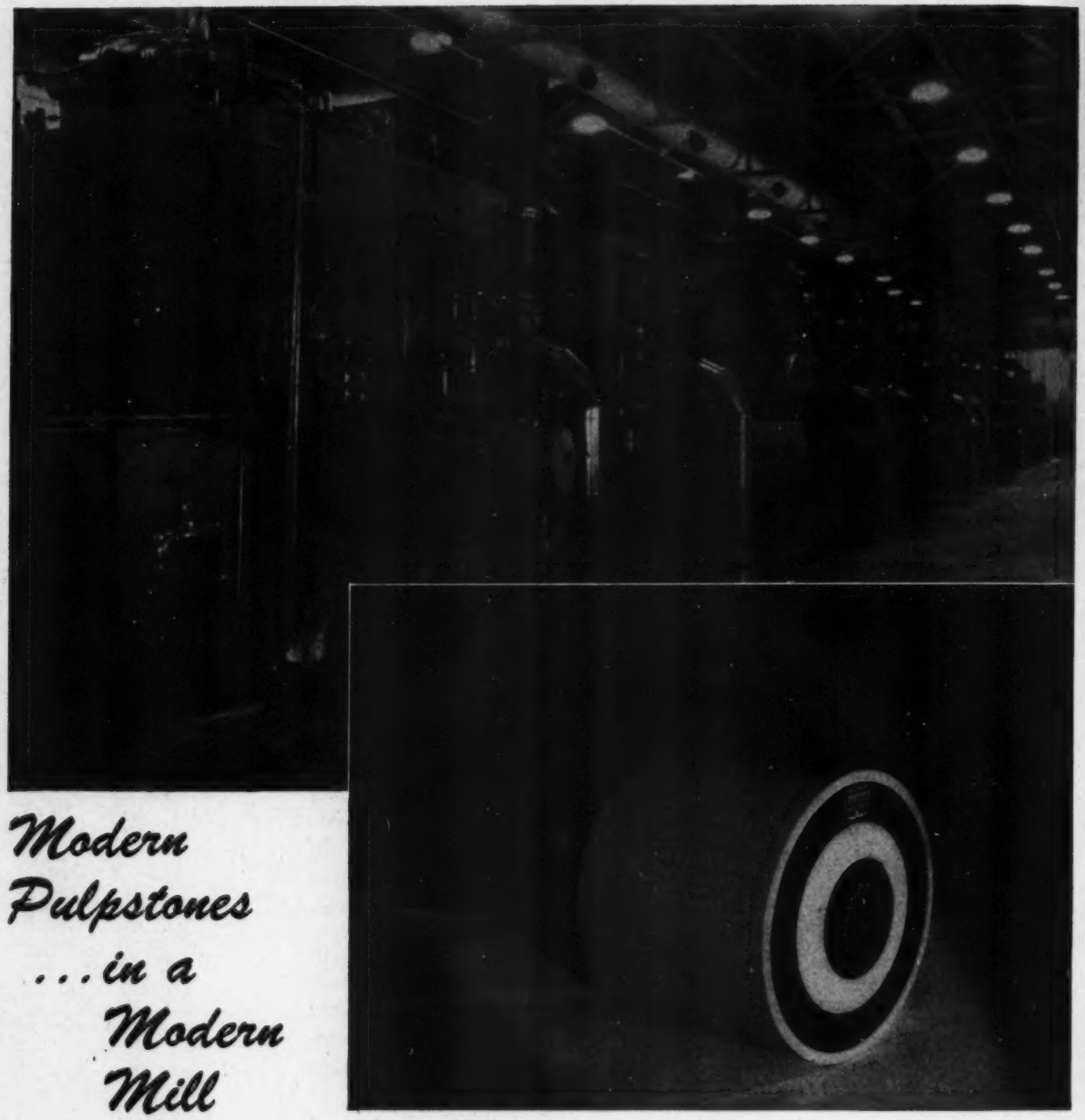
New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

Since 1800 (through six wars) the HOOPER name has symbolized highest quality in Cotton Duck and other Heavy Cotton Fabrics, Paper Mill Dryer Felts, Filter Cloth, Rope, Sash Cord.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS



Modern Pulpstones ...in a Modern Mill

Typical modern installation in which Norton Pulpstones are used at Ontario Paper Company, Thorold, Ontario. These Roberts Grinders are equipped with Norton Pulpstones. In this plant, pulp quality plus uninterrupted production is being maintained.

NORTON COMPANY, WORCESTER 6, MASSACHUSETTS, U. S. A.

NORTON ABRASIVES

25%

MORE CAPACITY!

From the same process equipment—merely by a change in the method of handling the condensate

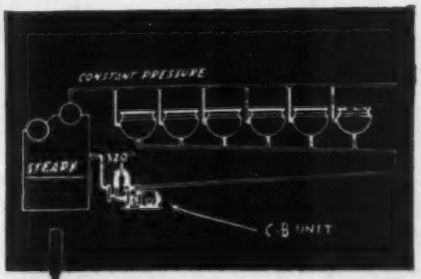
Are you interested in increasing production—and at the same time saving fuel? Of course you are! That is why you are sure to be interested in the Cochrane C-B System of High Pressure Condensate Return.

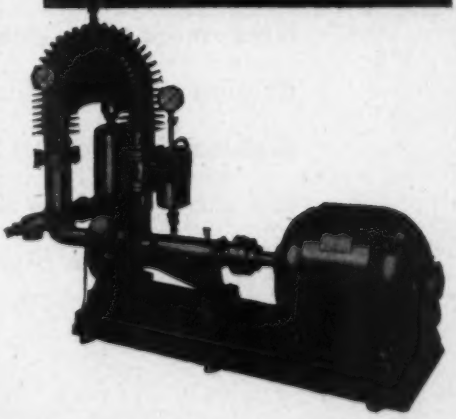
The results from the installation of the C-B System in processes using steam for cooking or drying are simply amazing. Fuel Savings up to 25% are not only possible but have often been exceeded. Production increases equally high are common and time savings and labor savings add to the overall economies.

Why shouldn't these savings be yours? The method of securing them is simple. You merely change from your open system of condensate return to the C-B Closed System installing the C-B unit, consisting of JET-pump, priming loop, strainer and air separator. Because the system is closed, there is no flash loss and condensate is returned to the boiler at close-to-process temperatures.

Dozens of enthusiastic letters on file show how many leading manufacturers have increased production, saved on fuel costs, raised the quality and increased the uniformity of that quality. These results are a matter of record and are merely indications of what can be done.

The wise manager looking to post-war competition will investigate the C-B System NOW. Write at once for complete information or consult our nearest representative.





COCHRANE CORPORATION • 3114 N. 17th St., Philadelphia 32, Pa.

COCHRANE C-B SYSTEM

CONDENSATE RETURNED TO BOILERS AT HIGH PRESSURE AND HIGH TEMPERATURE

THE VANDERBILT LABORATORY—NORWALK, CONN.

In War Times Use the

VANDERBILT LABORATORY

★

Now, more than ever before, it is important to keep production at peak efficiency. Visit our laboratory, bring your problems and let our facilities help you solve them. Here, we can show you how our materials can be used to your best advantage. We invite and appreciate your cooperation.

★

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

. . . Editorial . . . . . .

Paper—A Postwar Problem

▶▶▶ MOMENTOUS EVENTS are in the making on the European War Front. The rapid disintegration of the German defense is taking place. The Allied forces are at the German border and one does not have to be a military authority to predict the vital crack-up of Nazi resistance will occur very soon. For the ponderance of overwhelming armies of men, armament, and vital supplies is now concentrated upon them and can destroy them quickly unless they surrender.

Then what? And what effect will the collapse of the European Nazis have upon the paper industry?

In many groups of paper people, uncertainty seems to prevail. In others, there appears to exist the feeling that the collapse of Germany will bring an easement in government control of pulp, and a consequent increase in the supply of paper products. In a few cases, we have found the radical opinion expressed that with the end of the European resistance will come an oversupply of paper.

We are much inclined to take our stand beside those who believe that there is much uncertainty concerning paper supplies following the end of mass hostilities in Europe.

For one thing, paper and its intimate relative, lumber, are today the number one shortage headaches according to the War Production Board. They will continue to be the problem shortages for a long time to come. They and four other short commodities, like chemicals, crude rubber, tin and textiles, are outstandingly short among the galaxy of war and civilian essential commodities.

There will be no easement in their control and allotment this year. In the event of the re-election of the present administration, there may be no easement for years to come. The particular application that paper and lumber are suffering from is shortage of manpower to cut timber and pulpwood. The collapse of the European Axis this fall will not materially affect the manpower shortage in the woods.

There will be no sudden demobilization of armed men such as usually follows an armistice. The demobilization will be gradual.

In addition, there is an immense dammed-up demand of three years standing awaiting any let-up of pulp control, plus the demand from all other countries of Europe for their paper supplies for rehabilitation.

The world must come to America for its paper supplies. Sweden, above all paper producing countries over there, can satisfy but a fraction of European needs—England can take her whole output of pulp. It is only the wistful wishers who can see any return of normalcy to the pulp and paper industry after the Axis collapse. A close examination of the postwar situation, we believe, will disclose the fact that America will be the busiest country in the world after the War, and the busiest industry will be the paper industry.

Pulp and Paper Research

▶▶▶ WHERE IS THE PULP AND paper making industry headed with its research activities? How far reaching is the work that is now being carried on in mill laboratories, in the laboratories of firms supplying the pulp and paper industry with one or more of the multitudinous variety of products required by it, in the research laboratories of colleges and universities, or in the research laboratories of commercial organizations created for the purpose of serving industry?

Insofar as pulp and paper making organizations are concerned, some few of them have been doing and are continuing to do an outstanding job of research with results that have been far reaching. The present day industry could not have developed without them.

However, it is believed that most of the mills have been content to rest on their oars and to "let George do it." They have been satisfied to be followers rather than leaders, and to take crumbs from the efforts of the more research minded organizations.

The question naturally arises—"How large should a mill organization be to institute a research program?" It is believed that no mill is too small to enter into such activity. The extent and nature of the program necessarily would need to conform to the size of the mill operation; but, in any event, some definite program should be conceived and developed.

No mill organization should be content just to go along. Discontent can be and often is a stimulus to progress. It is only essential to bridle discontent and to keep it on the proper highway.

Notwithstanding all the progress which has come through research, there is the possibility that the present tendency may be for too much orthodox research. Perhaps more encouragement should be given to the worker who resembles the old-time inventor, the one who is empirical and unorthodox in his work. Out of such encouragement might come results of a character that typical research procedures would not uncover.

Then, too, the need for applied research never should be neglected. Fundamental research is essential for long range work; but applied research is for the present and near future.

Dr. Willard H. Dow, upon receiving the Gold Medal Award of the American Institute of Chemists on May 13, 1944, said in part:

"An idea, no matter how weird, may grow into a constructive thought and enlarge to a new approach. Then a new industry is aborning. Experience, ideas, research—all accumulate and produce a new approach or a new product or a new thought. Each borning is cherished by the one seeing the vision and is often communicated to others, but these visions are things coming only to those who have prepared themselves to accept them."

Current Thought

WILLIAM SIBLEY

Some Observations on This and That

▶▶▶ THIS IS a crazy war. Tonight's newspaper presents, as usual, a map of Europe showing where the Allied forces are, and where, it is conjectured, they will go. This is a war without a "front." Or, more accurately speaking, a war which is *all* "front." While we are successfully headed for Germany, our armies must go in all directions—not only westward, but north, south, east, up and down. The whole state of France is a jumbled mixture of British, Canadians, Americans, French, Germans, and Maquis.

To all intents and purposes, the European phase of the war is about over. It may be "over" before this gets into print. It may not be over for some time. But we are now on the mopping-up stretch; with Hitler just around the corner from liquidation, and with Himmler, Goering, Goebbels, Ribbentrop, already planning means to save their filthy hides somewhere in Argentina or Japan. There is one thing I hope for, and that is that Hitler is liquidated by his own German people. If England or the Americans have to put him away, then to the several million fanatics who yet believe in Nazism, Hitler will be a martyr, one to deify for evermore. But if he is killed by his own race, that deification won't be so pronounced.

While the people of Germany probably will not put up a formidable fight, the armistice or surrender (and there may be no such formal thing) will not end the sniping, the underground trouble, the guerrilla warfare. We have a police job on our hands which will doubtless keep a lot of American soldiers away from home for years.

Isn't it a crying shame that medical science cannot devise some means for detecting psychopathic tendencies in individuals, then disposing of them before they get out of hand? If a handful of men like those named could have been liquidated back in 1930, the Junkers and warlike Prussians would have been hard put to find guys to upset the world. Right along that same line, I am quite convinced that the liquidation of that Louisiana crackpot, Huey Long, was a great Godsend to this country. What with the deepest depression in history, followed by an unprecedented administration and an international war, that chap might conceivably have been a very serious menace to our national welfare. There are always enough crackpots ready to follow crackpot leaders to stir up serious trouble.

* * *

▶▶▶ NOW THAT DEWEY is planning a political tour in his own interest, we have the interesting sight of Churchill, the King and Queen of England, Stalin (maybe), Molotov, and perhaps even Chiang Kai-shek invading this country for "conferences." Now if that won't take Dewey off the front page and put him back on page seven, I don't know my newspapers! When it comes to politics, Franklin is the guy who can cook on all four burners—and with gas.

* * *

▶▶▶ WHEN F. D. R. was asked to define his stand on certain fundamental principles during his first year of tenure (if you can remember back that far) he said that he was "just a little left of center." Since then he and his whole New Deal have gone a long way past "center" and always to the left. Here in the United States, the administration as well as everyone else should keep to the right. But the sad fact is that already there are more radical left-side plans in the making in the advent of a fourth term. We'll be faced with a higher level of hourly wage rates to offset reduction in earnings due to the elimination of overtime. There is a resumption of plans to increase corporation taxes out of earnings, or force them to spend savings for capital improvements. Unemployment insurance will be broadened in coverage if Congress can be convinced it should not be so balky. Socialization of medicine to gain increased favor. Outright government ownership of many utilities, and more drastic governmental control of all industry is in the cards, if the New Deal can be kept alive for another four years. It isn't a very pretty picture.

* * *

▶▶▶ SPEAKING OF GOVERNMENT ownership, let me quote the copy in a recent advertisement sponsored by the Union Oil Company of California. I submit that it makes a lot of sense. "In 1940, our last normal year before the war, American people consumed 55½ *billion* gallons of petroleum products. This amounted to 427 gallons per person—9 pints a day for every man, woman and child in the United States.

"By comparison, the people of Europe consumed 30 gallons per capita in their last peacetime year—1/14th as much—and the rest of the world 13 gallons per person—1/33rd as much. Since most petroleum products are used to power or lubricate machines, these figures will bear remembering.

"For they mean that the daily life of the average American is just about 14 times as mechanized as the daily life of a European. This may or may not mean that our life is 14 times *better*. But the fact still remains that we use the machines.

"So someone has to furnish the petroleum to keep them going. In this country there are 8,267 individual oil companies working full time at this job. During 1940 they made a profit of 8/10ths of a cent per gallon on the 427 gallons of product you used—$3.42. The rest went right back into the costs of producing the products and getting them to you. Theoretically, if the Government owned the oil industry, you would have saved that 8/10ths of a cent. (Same costs but no profit.) Although there's never been a government bureau yet that was run as efficiently as a business. But it would mean the end of competition; of the incentive to constantly improve products and lower costs which are the driving force of our American system; and worst of all, of individual freedom. Under the circumstances, that's quite a birthright to sell for 8/10ths of a cent on the gallon.

"America's *fifth* freedom is free enterprise."

LINK-BELT

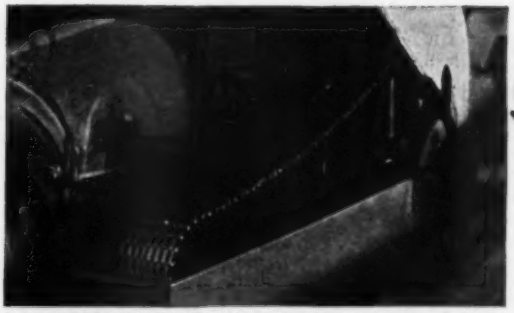
MATERIALS HANDLING AND POWER TRANSMISSION MACHINERY

SERVES THE ENTIRE PULP & PAPER INDUSTRY

3 BULK-FLO CONVEYOR-ELEVATOR Units Handling Wood Chips Efficiently and at Low Cost.

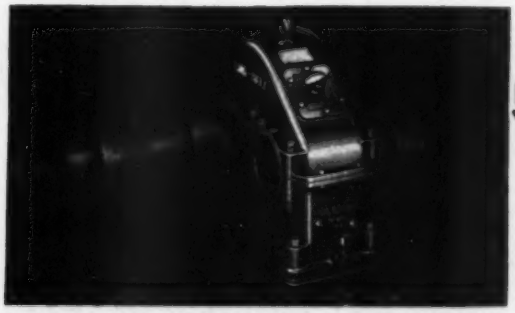
P.I.V. GEAR VARIABLE SPEED CHANGERS Accurately Control Speeds on Cutters, Press-Rolls, Coaters, Pumps, etc.

CHAINS FOR CONVEYORS & ELEVATORS . . . There Is a Standard Link-Belt Chain for Every Service.



SILVERSTREAK SILENT CHAIN DRIVE . . . The Ideal Drive for Beaters, Pumps, Calenders, etc.—Wherever Long Life and Efficiency Are Desired.

BELT CONVEYORS Assure Low Cost Handling of Sulphur, Lime, Salt Cake, Wet Pulp, etc.



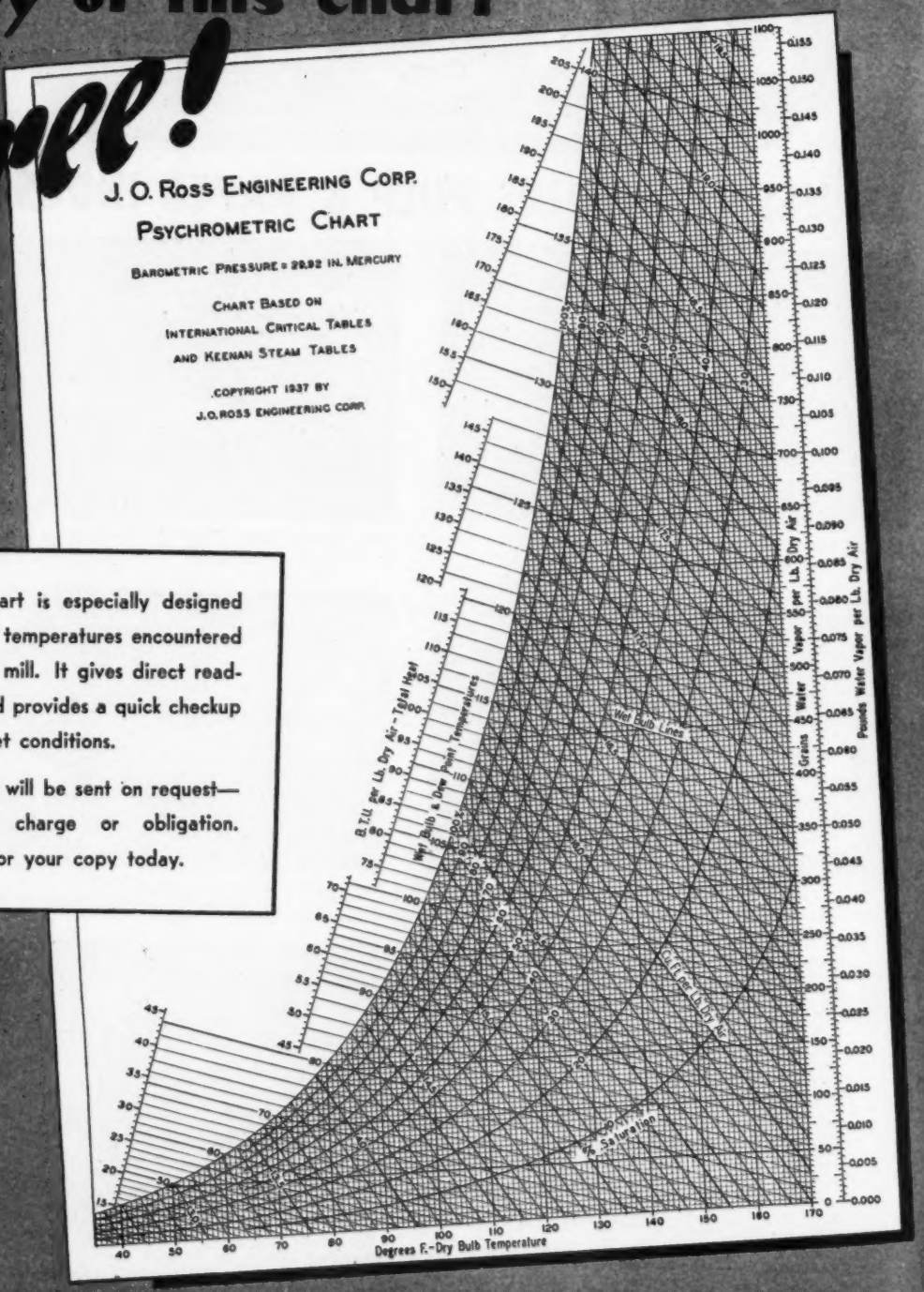
SPEED REDUCERS For Every Service—Herringbone, Worm, Motorized Helical Gear Types.

OTHER LINK-BELT PRODUCTS INCLUDE: Chains and attachments of malleable iron, Promal and steel . . . Silverlink Roller Chains and Sprockets . . . Log Hauls . . . Slasher Table Chains . . . Conveyors to and from barking drums . . . Chains for suspending and driving barking drums . . . Sorting Table Conveyors . . . Chip, Chemical and Refuse Conveyors . . . Log Stackers . . . Hogged Fuel Handling Equipment . . . Skip Hoists . . . Conveyors of all types . . . Automatic Underfeed Screwtype Stokers . . . Portable Conveyors, Loaders and Unloaders . . . Vibrating Screens . . . Water-Intake Screens . . . Roto-Louvre Heat Dryers and Coolers . . . Screen type Dryers . . . Car Spotters . . . Sprockets . . . Gears . . . Pulleys . . . Couplings . . . Clutches . . . Ball, Roller and Babbitted Bearings . . . Grease Cups . . . Safety Collars . . . Base Plates . . . Shafting . . . Paper Roll Handling Equipment . . . Special Machinery, etc. Catalogs sent on request. 2134

As specialists in the design, manufacture and application of materials handling and power transmission machinery for all industry, Link-Belt engineers have learned how to apply an extensive knowledge and experience, effectively, to the solution of all kinds of materials handling and power transmitting problems. Because Link-Belt makes many types of conveyors, chains and power transmission machinery, we can be of incalculable service in recommending the equipment most certain to aid in attaining efficient production.

LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8. Offices, factory branch stores and distributors in principal cities.

Copy of this chart Free!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Psychrometric Chart
Barometric Pressure = 29.92 In. Mercury
Chart Based on
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and Keenan Steam Tables
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Degrees F.-Dry Bulb Temperature
Pounds Water Vapor per Lb. Dry Air
Grains Water Vapor per Lb. Dry Air
B.T.U. per Lb. Dry Air - Total Heat
Wet Bulb Lines
Dew Point Temperatures
Cu. Ft. per Lb. Dry Air
% Saturation

This chart is especially designed for the temperatures encountered in your mill. It gives direct readings and provides a quick checkup on outlet conditions.

A copy will be sent on request—without charge or obligation. Write for your copy today.

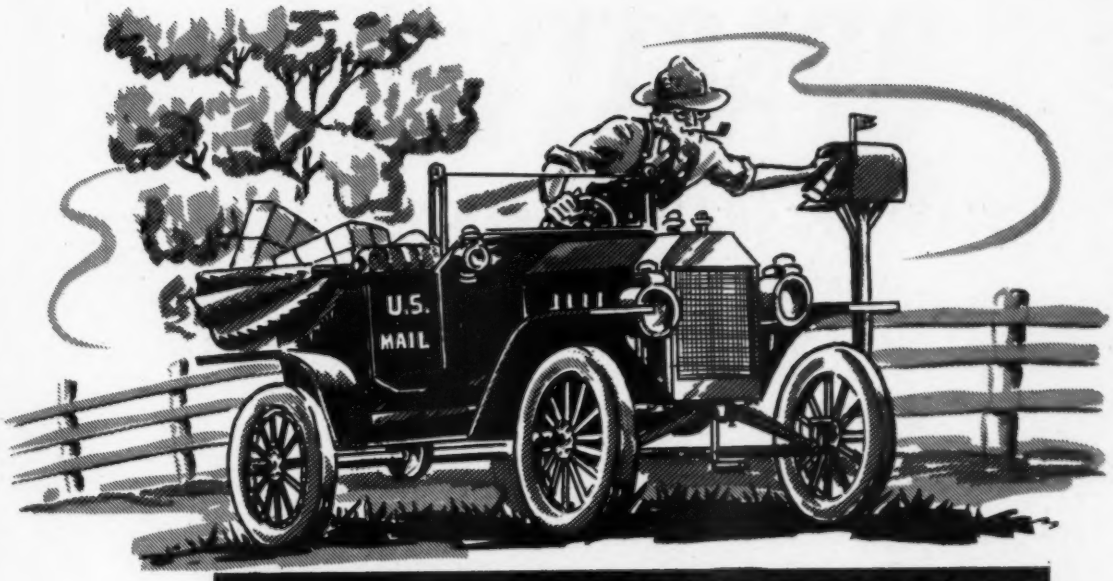
J.O.ROSS ENGINEERING CORP.

350 MADISON AVE., New York 17, N. Y.

CHICAGO 6—201 North Wells Street DETROIT 3—12953 Greeley Avenue

ROSS ENGINEERING OF CANADA, LTD., Dominion Square Building, Montreal

CONTROL OF AIR FOR MODERN INDUSTRY



THERE'S DEPENDABILITY in APPLETON FELTS Too!

Like the mail carrier who come through storms and sunshine that today he is the symbol of dependable service throughout the country, so too are Appleton Felts the mark of dependability.

make APPLETON FELTS good paper

Paper mills since 1890 have been depending upon Appleton Felts for service. They have learned by experience that Appleton Felts during these years meet all requirements of mill production, year after year.

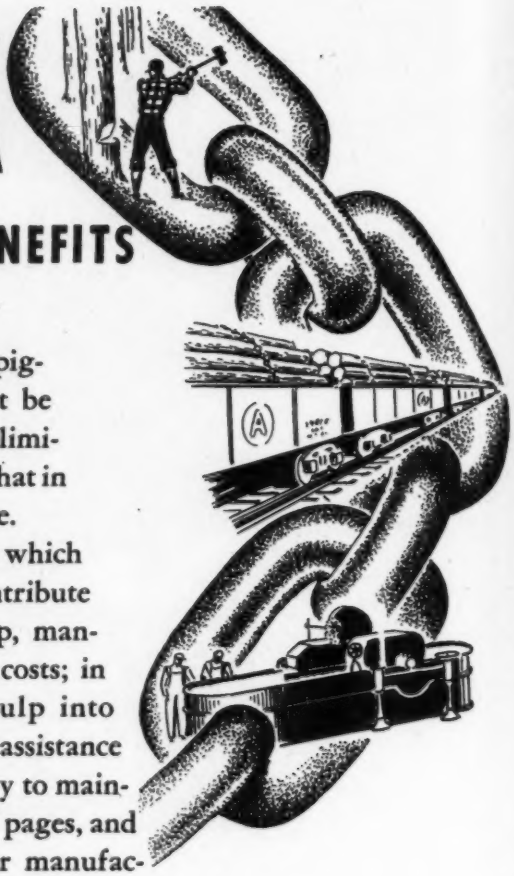
Today's high speed production is met as easily as 1890's, because the Appleton Felts have progressed with the rapid progress of the paper industry.

Appleton Woolen Mills

APPLETON • WISCONSIN

OPACITY

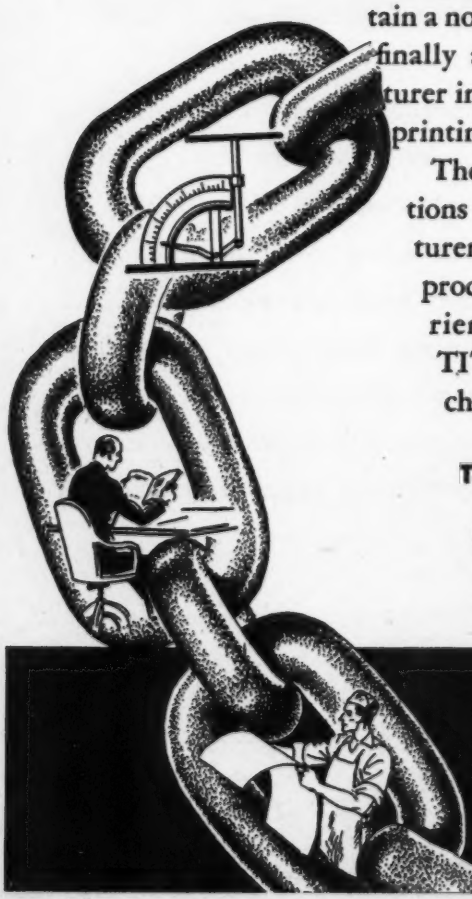
STARTS A CHAIN OF BENEFITS



The opacity that TITANOX pigments impart to paper cannot be measured alone in terms of eliminated show-through, though that in itself is of highest importance.

In the chain of benefits to which these modern pigments contribute are a saving in wood pulp, manpower and transportation costs; in the materials to turn pulp into paper; in mailing costs; assistance to the publishing industry to maintain a normal number of pages, and finally aid to the paper manufacturer in producing papers with fine printing qualities.

The lifting of war-time restrictions will permit paper manufacturers to again institute their own procedures. But who, having experienced the notable benefits of TITANOX pigmentation, would change?



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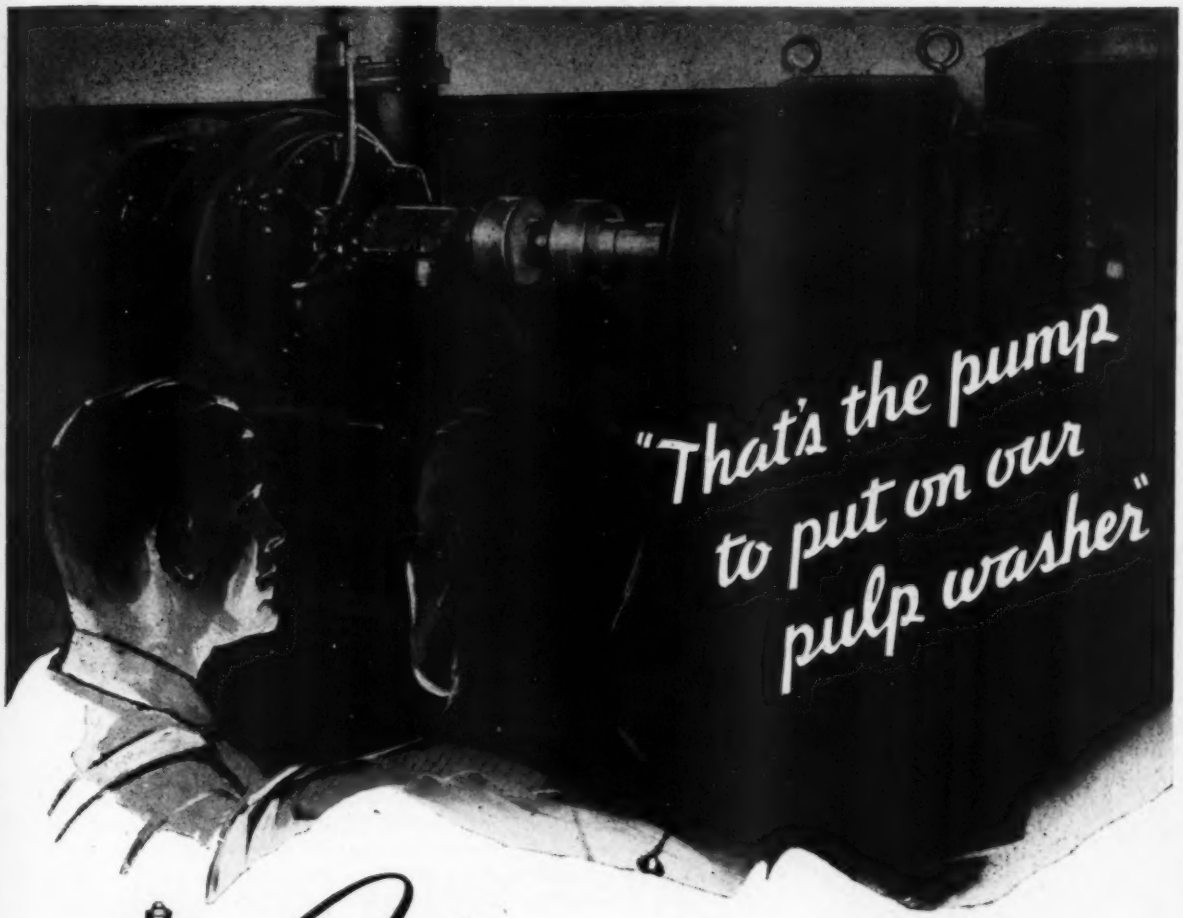

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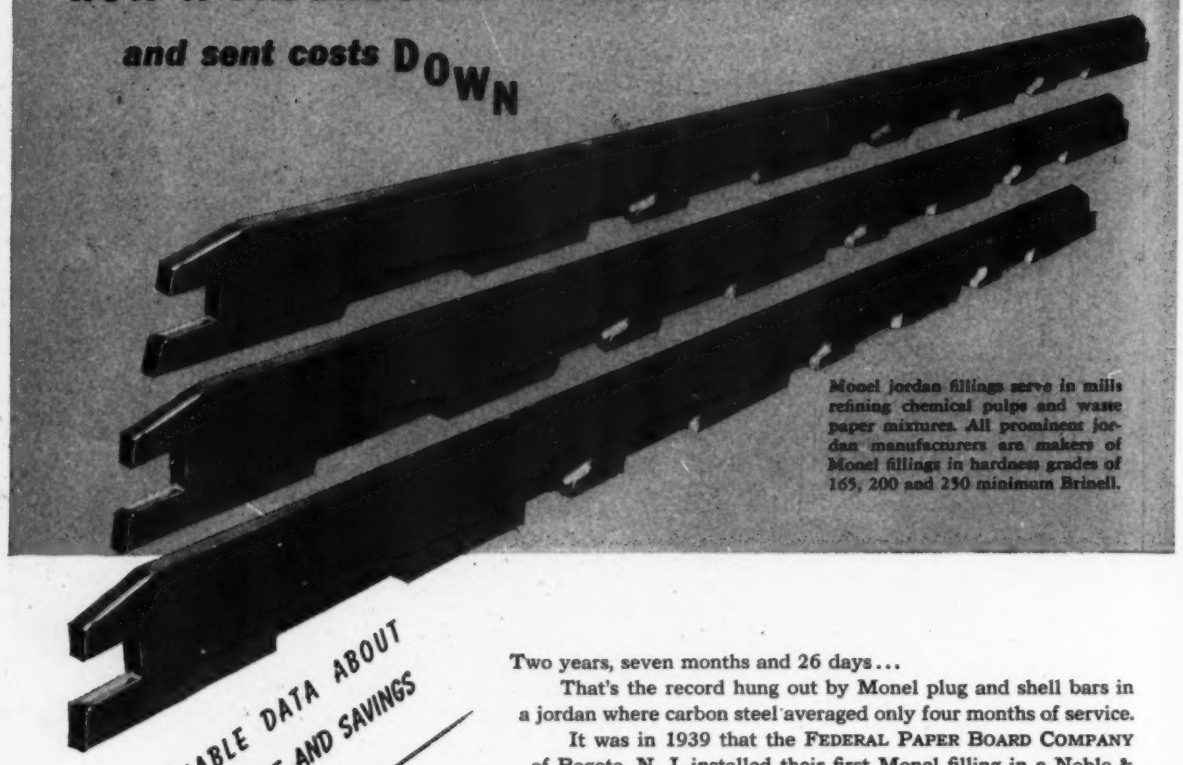

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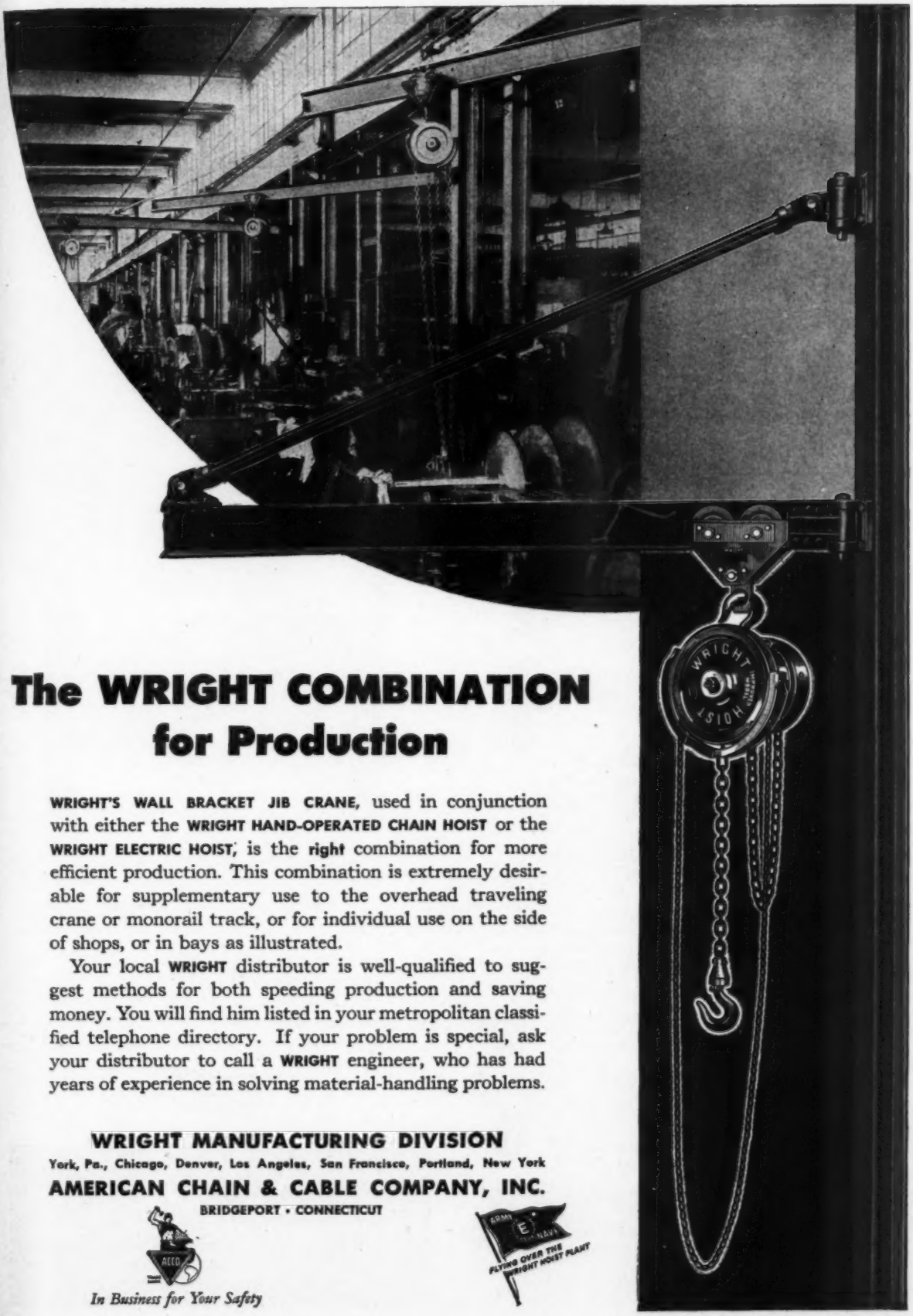

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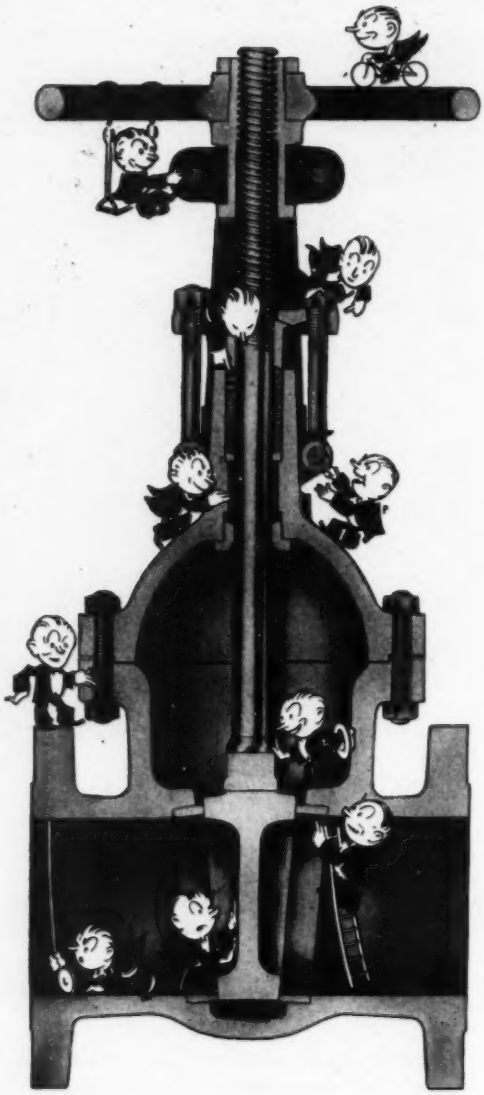

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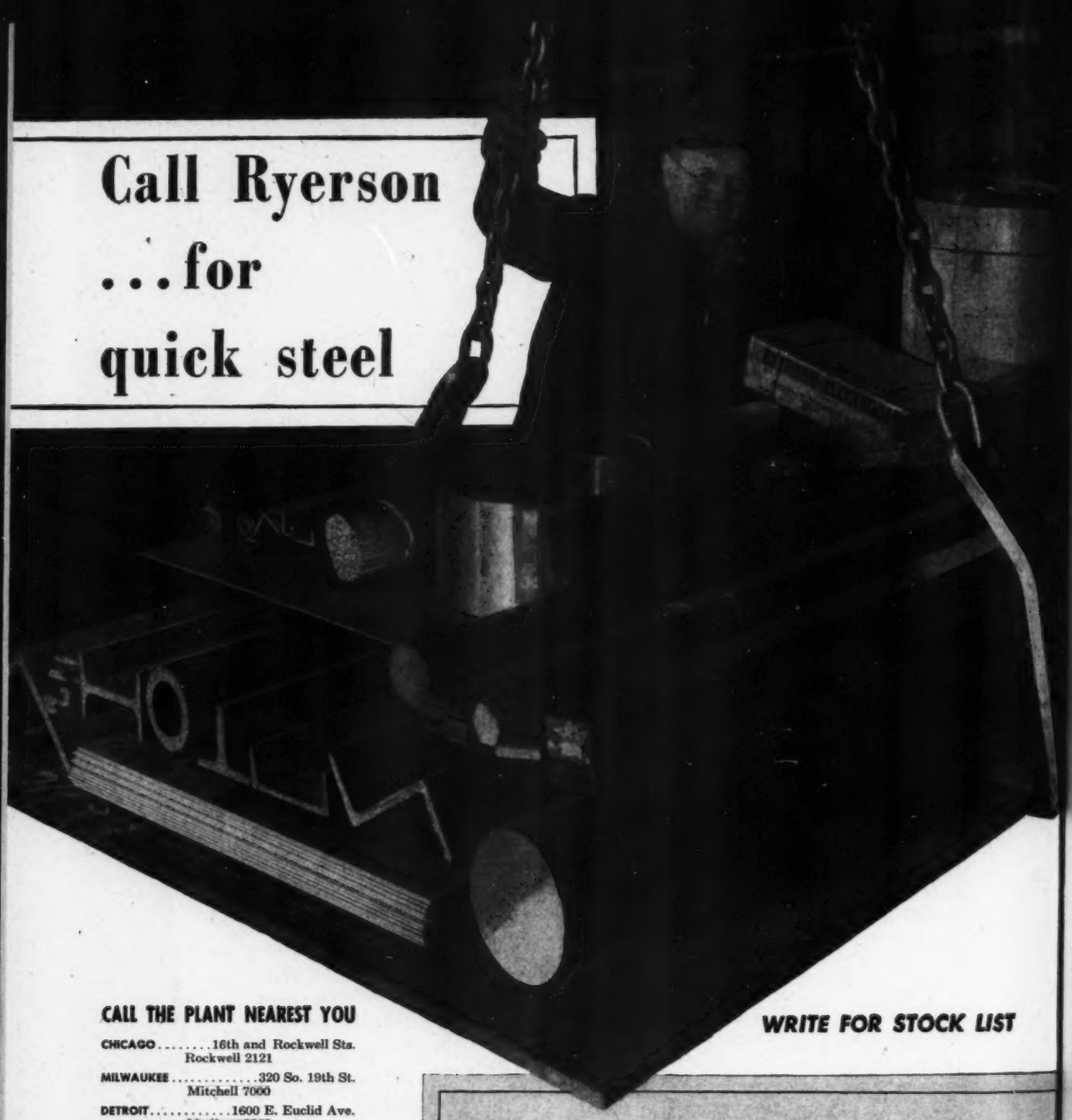

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Process Control of Quality by Statistical Method

JOHN B. CATLIN
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▸▸▸ TECHNICAL CONTROL OF product quality in the paper industry began before World War I.

In the interval between the two wars, the industry employed a large number of technically trained men, many of whom concentrated on control and its problems. Significant test methods were developed to aid operator judgment. Routine testing on a shift or hourly basis became commonplace. Testing controls were pushed back into the process as far as was necessary to insure the detection of trends before much poor quality product was made. In many cases continuous indicating, recording, and even controlling instruments were applied to both process and product variables. Applied science brought the industry a long way from the old rule-of-thumb procedures.

In spite of the enormous amount of work done and money spent there is still much to be learned about quality control. Practical mill men and experienced technical men are particularly aware of problems unsolved by present technical methods. For example, there are no objective or scientific means of establishing product quality goals for any process. The same may be said for customer specifications. Thus authoritative product standards are written which are either disregarded in the mill or produce conflict; e.g., unfortunate situations occur such as testers providing the data desired rather than that obtained. Numbers produced by routine testing are far from uniform. No rational methods of judging them are in use. Consequently there is little uniformity of judgment with the result that over and under control frequently occur. For the most part the industry does not even measure two of the most important aspects of quality from a customer point-of-view; viz., variability and homogeneity. This tends to produce a situation where the customer tires of complaining and the mill questions customer integrity.

Sincere and energetic operators and technicians experiencing difficulties similar to those mentioned are disturbed and confused. They don't always know when to become alarmed, where to spend their quality efforts, and when to quit improvement work. Such problems are magnified in large organizations employing a technical staff not directly concerned with mill control. These shortcomings of the industry's technical control of quality could be augmented considerably. Enough has been said so that the need for improvement is evident.

The science behind present technical methods is functional or exact. It is based on the concepts of arithmetic and algebra and the ability of these mathematical sciences to measure differences and relationships. This science is founded on the law of cause and effect which states that every effect has a cause; when everything finally is known, every observed phenomenon can be perfectly explained and every future phenomenon can be perfectly predicted. Practical men, operators, or technicians, long have recognized that something was seriously wrong with this exact science. They have been forced, for want of better tools, to use rather simple theory when working with a complex physical world. This failure of orthodox scientific theory, as taught in most of our schools, to provide technical men with objective methods for working with the real world as it exists in paper mills is a serious weakness in the present technical control of quality. It, therefore, should be very interesting for practical paper men to learn that the simple law of cause and effect has been definitely abandoned by qualified scientists in many fields. These men now recognize the inherent uselessness, if not impossibility, of perfect knowledge. They have abandoned simple functional concepts for more effective but more complex statistical theory. They believe that the physical universe is inherently statistical in the sense that a great deal of unexplainable and unpredictable phenomenon will always exist, that nothing will ever be known exactly, and that all knowledge is probable.

With a few exceptions these statistical concepts are not being taught in the technical schools. This is due partly to the traditional lag between research and pedagogy as well as the fact that most of the theory development has occurred outside of the engineering sciences which are usually thought of as exact.

Modern statistical theory accepts[1] some quality variation as unavoidable. Instead of neglecting variation, statistical methods accept and provide ways and means for working with it. This new science teaches that a controlled product is a variable one[2], establishes objective standards of quality, and provides methods for detecting lack of control in the presence of variation. These ideas may be more readily understood by the development of a simple example. Suppose that a normal fourdrinier machine is making a 50-lb. (25x38-in.-500) sheet of book paper, trimming 120 inches at 700 fpm. Reels are swung up about every 45 minutes weighing approximately 4,800 lb. Weigh sheets (samples) 25 in. x 38 in. are cut from the end of each reel and weighed on a typical basis weight scale to determine whether or not adjustments should be made to the process. This is a typical control problem solved constantly by machine tenders, i.e., when to believe from numbers produced by sampling and testing that some process adjustment is necessary. Two mistakes can be made: (1) make a process adjustment when no real change in quality has occurred, and (2) make no process adjustment when a real change in quality has occurred. Statistical methods do not eliminate these mistakes but they do minimize them.

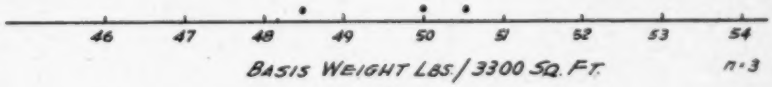

Figure 1

Further, suppose that the best reel of paper ever produced by this hypothetical fourdrinier machine is set aside for testing. The tester cuts three (n = 3) samples (front, center, and back) as described, weighing them separately. The numbers obtained are recorded as points on the simple scale in Figure 1; they, of course, are not identical indicating the presence of variation even though this is the best reel of paper ever produced by the machine. This annoyance is customarily corrected by logging only the average of the three numbers. In this case, however, the sampling and testing are

(1) Statistical method from the viewpoint of quality control—Shewhart & Deming.
(2) Constantly variable within limits as will be explained later.

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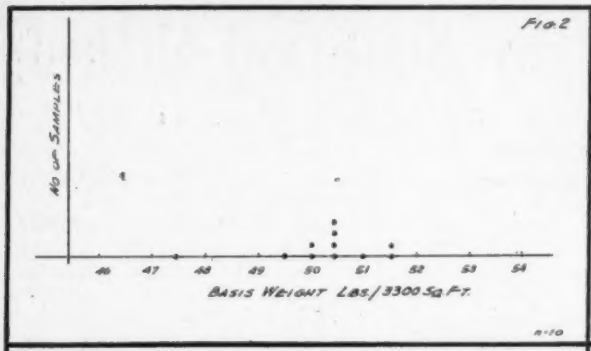
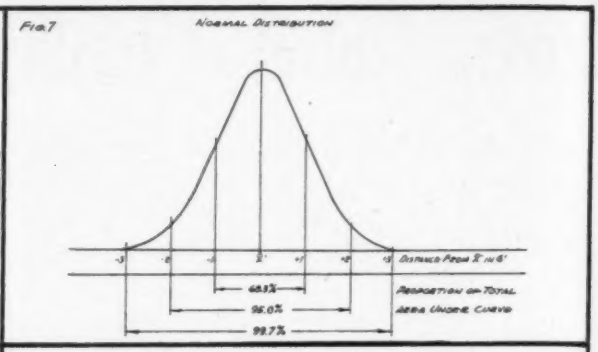
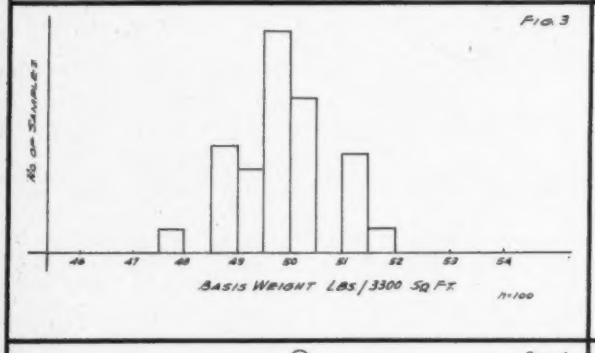
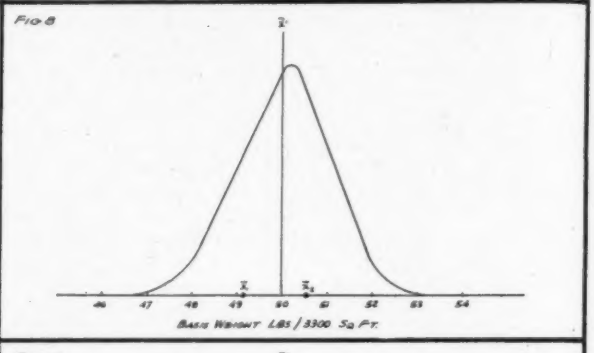
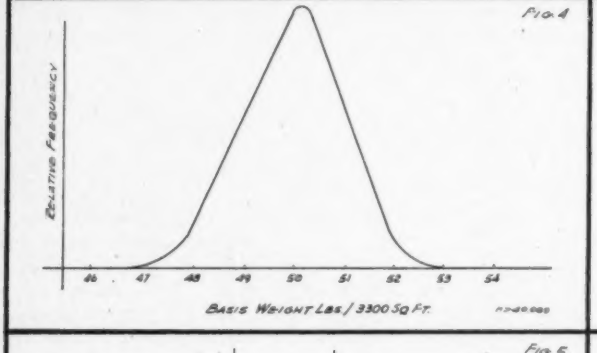
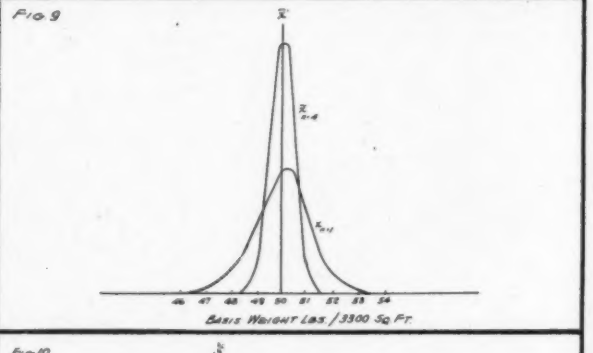


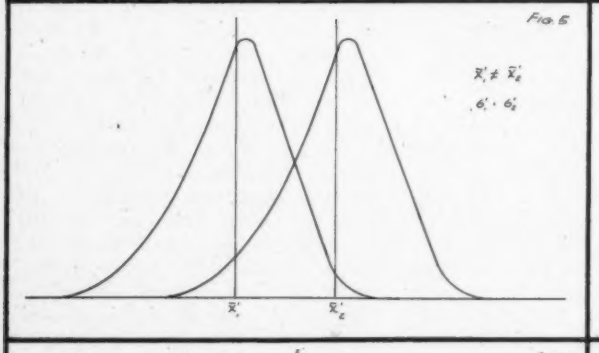


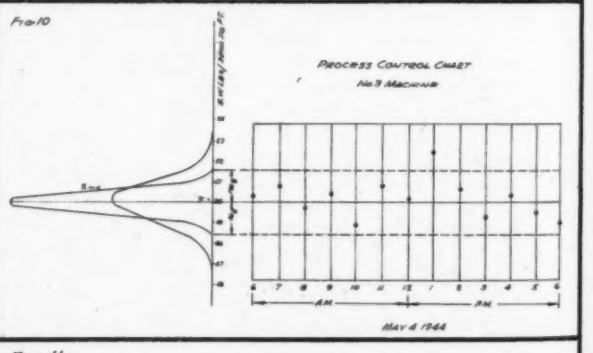


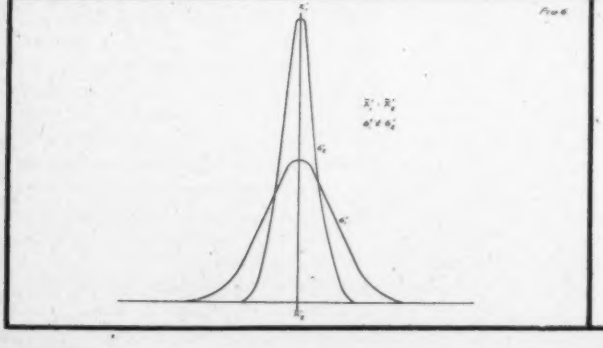


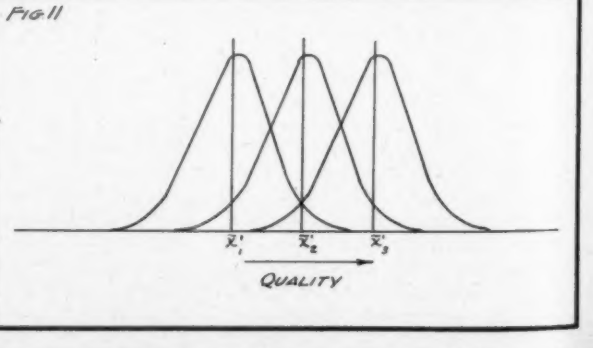












continued until ten samples are tested. The results are shown in Figure 2. Even more variation is now observed with some numbers repeating themselves. By the time one hundred samples have been cut and weighed, the data can be plotted as the histogram in Figure 3, where the height of each bar indicates the frequency of appearance of the corresponding basis weight value. When the entire reel is cut into 25 in. x 38 in. samples and weighed, over 40,000 numbers are obtained. This enormous mass of data can be presented as the smooth curve shown in Figure 4. This curve is known to the statistician as a distribution, population, or universe. It represents all that can be known about the subject investigated—in this case, basis weight. It is the statistician's tool for describing variation. Figure 4 indicates that the majority of the basis weights cluster about the central portion of the curve, that the more extreme values occur infrequently, and that the variates are not distributed symmetrically about their central tendency. There are many kinds of distributions, but the one in Figure 4 typifies those found in the paper industry.

Distributions have many characteristics called parameters. Two of them are of great practical values, viz., central tendency and variability. The best measure of central tendency is the arithmetic average or mean ($\bar{X}'$)[3]. The most efficient measure of variability is the standard deviation (σ')[4]. Both the average and the standard deviation are in identical units, basis weight pounds per 3,300 sq. ft., in this example. Figure 5 shows two distributions with identical standard deviations and differing means. Figure 6 illustrates two distributions with identical means but differing standard deviations. As the range, spread, or dispersion increases, the standard deviation increases.

There is a special kind of distribution known as a normal distribution of sufficient practical importance to justify description here. It is characterized by being symmetrical about the mean and having a definite relationship between the area under the curve and the distance from the mean measured in standard deviations as shown in Figure 7.

The 40,000 odd weigh sheets were piled on skids and remained available for more measurements. Four sample sheets were taken from one of the skids and an average ($\bar{X}$) calculated[5] from the four basis weight numbers obtained. The average of the first four specimens was entered as $\bar{X}_1$ in Figure 8. Note that $\bar{X}_1$ did not coincide with $\bar{X}'$, the true basis weight of the reel. Another sample of four weigh sheets was taken and another sample average calculated and entered as $\bar{X}_2$ in Figure 8. $\bar{X}_2$ not only failed to coincide with $\bar{X}'$ but varied from $\bar{X}_1$. As this process continued and all of the 40,000 or more sheets were handled as samples of four ($n = 4$), a smooth curve was drawn showing the distribution of sample averages or means. This is the curve $\bar{X}_n = 4$ in Figure 9. It is apparent that sample averages ($\bar{X}_n = 4$) vary somewhat less than variates ($x_n = 1$) obtained from single samples. Statistical theory describes the relationship between sample mean ($\bar{X}_n$) variation and that of single samples (x)[6]. Furthermore, it is known that the distribution of sample means is normal regardless of the shape of the parent distribution. As the sample size increases the statistic, ($\bar{X}_n$), calculated from the sample is subject to less variation[6], but *all* of the paper must be sampled and weighed before the true or parameter average ($\bar{X}'$) is known. Thus variates or numbers from single tests are merely data from which statistics are calculated that are used to estimate parameters. Perfect knowledge in this example is the parameter value which, of course, is practically never known.

With these simple fundamentals developed, it is possible to return to the process control problem introduced by this example. If the fourdrinier machine operates in such a way that the variation within reels (σ') is constant in time, then the variation to be expected in the means of samples taken from swing-ups can be predicted. The machine tender can be told whether or not the variation observed in his samples is due simply to sampling fluctuation as explained or must be considered as due to a real shift in basis weight level (as in Figure 5). The most efficient statistical device for providing this objective basis for action on the process is the control chart.[7] A sampling investigation in this example showed that the process was producing paper having a true average ($\bar{X}'$) of 50 lb. using the testing described and a variability (σ') of 1.0 lb. within swing-ups. The process distribution curve describing the total effect of all chance causes of variation of basis weight within swing-up is shown in Figure 8. It is decided to take four representative basis weight samples ($n = 4$) from each swing-up for the operation of the process control. Figure 9 shows the limits inside which practically all averages[8] calculated from four samples ($\bar{X}_n = 4$) would fall so long as the samples are coming from a single distribution having a mean ($\bar{X}'$) of 50 lb. and a standard deviation (σ') of 1.0 lb. When Figure 9 is rotated counter-clockwise 90 degrees and time ordinates are added as in Figure 10, a typical process control chart for basis weight means is obtained. In this example, testing begins at 6:00 A. M., May 4, 1944, and continues hourly throughout the day. There is no reason to believe that any real shift in average basis weight occurred except at 1:00 P. M. when the sheet became somewhat heavier than 50 lb. The machine tender turned off a little stock and the sheet returned to the 50 lb. level. No other basis weight adjustments were necessary during the day.

This is not the place to discuss how sampling investigations are conducted to establish process control charts. The bibliography at the end of this article will prove helpful on this problem. The exhaustive sampling done in the example discussed is not satisfactory

(3)

$$\bar{X}' = \frac{\sum_{1}^{n} X_i}{n}$$

(4)

$$\sigma' = \sqrt{\frac{\sum_{1}^{n} (\bar{x} - x_i)^2}{n}}$$

(5)

Specimen No.	*Basis Weight*
1	X_1
2	X_2
3	X_3
4	X_4
	$\sum_{1}^{4} X_i$

$$\bar{X} = \frac{\sum_{1}^{4} X_i}{4}$$

(6)

$$\sigma_{\bar{x}_n} = \frac{\sigma'}{\sqrt{n}}$$

(7) Economic control of quality of manufactured product—W. A. Shewhart.

(8) $\bar{X}' \pm 3\sigma_{\bar{X}}$ includes 99.7% area under curve.

for establishing control levels and was done for purposes of illustration only. Control charts are easily prepared; the mathematics required do not go beyond arithmetic.

Control charts have many advantages not possessed by the testing logs now widely used. As graphs alone they are more easily and quickly read than tabulated data. The information contained on 15 or 20 test logs can easily be put on the same control chart. They present both process history and product standards for ready reference particularly when kept at the machine.

Perhaps the most important control chart function is that of providing a uniform and objective method of interpreting testing data, a uniform basis for action on the process, minimizing the mistakes of under and over control. It can be shown theoretically and has been the experience practically that the upper and lower control limits defined by the chart represent the limits beyond which variation either cannot be reduced or it is uneconomical to go. When samples taken from a process act like they are coming from a single distribution, the process is in a state of statistical control. Only chance causes of variation are influencing product quality. The remaining variation is inherent in the process and can be further reduced only by some fundamental change in material, equipment, or people. Control charts thus establish rational product standards and introduce the concept of controllable quality. Before control is attained, they measure progress towards control[9]. Very few paper processes are statistically controlled; months if not years are required to reach this goal. By detecting assignable causes of variation as they occur, establishing objective quality standards, and measuring progress towards control, the charts are powerful tools for the improvement of product quality. There are many reasons for striving to achieve statistical control. One of the most important is efficiency of product inspection. With destructive testing making sampling inspection necessary and customary sample sizes well below 0.005 per cent, assurance of lot quality must be obtained from small samples. This is possible only when the process is in control.

Control charts also provide a measure of homogeneity. It can be seen in Figure 11 that when a process is not controlled assignable causes of variation may be shifting the mean quality level.

$$(9)\quad \frac{\text{No. points within limits}}{\text{Total No. points}} \times 100 = \%\ \text{controlled}$$

If the normal control level occurs around $\bar{X}'_{\bar{x}}$, then points falling outside the control limits indicate poor control or lack of homogeneity between sampling groups. "Per cent controlled" is not only a measure of progress towards perfection but is in itself an important quality statistic of great customer importance.

It has been found that where a dozen or so different physical tests are made for process control, operator judgment as to where to attempt quality improvement is frequently reorientated by control charts. They also provide ready comparison by physical property, by grades, between machines and mills regarding not only quality level ($\bar{X}'$) but also variability (σ') and homogeneity (per cent controlled). They provide an acid test for money spent on equipment or material for quality improvement as well as pointing out faulty quality training.

Modern statistical methods are very useful to industry outside the general field of product quality. Within this field their application is by no means limited to process control. Statistical methods are being used successfully today in the paper industry to aid judgment in the solution of quality problems concerned with material inspection, presentation of data (quality reporting), product specification, process experiment, laboratory experiment, development of significant tests, calibration of testing instruments, and operator quality training.

Selected Book Bibliography

Engineer's Manual of Statistical Methods—L. E. Simon, John Wiley & Sons, 1941.

Economic Control of Quality of Manufactured Product—W. A. Shewhart, D. Van Nostrand 1931.

Control Chart Method of Controlling Quality During Production, Z1.3—1942 American Standards Association.

Guide for Quality Control and Control Chart Method of Analyzing Data, Z1.1 and Z1.2—1941, American Standards Association.

A.S.T.M. Manual on Presentation of Data—A.S.T.M. 1943.

Rating of Electrical Machines Increased with Silicone Insulation

R. C. BERGVALL, Assistant to Vice President
Insulation Development Group
Westinghouse Electric and Manufacturing Company

▶▶▶ AS MUCH AS 50 per cent reduction in weight of electric equipment is possible where design limitations are based on insulating temperature by using the new Silicone insulating varnishes. These high temperature insulations also make possible a substantial increase in the output of small motors using the same frame, where the operating temperature can be raised. They offer the additional advantages of ability to operate at higher ambient temperature, and to greatly increase life when operated at present temperature conditions. Silicone resins, and their use as insulating varnishes and bonds, definitely fill the void between organic and inorganic insulating materials.

There has long been a demand for high temperature insulation having better thermal stability. Designers have felt the need for such insulation for at least three very special reasons:

1. It offers possibilities for reduction in the size and weight of electrical equipment, with no reduction in service life, where the operating temperature can be increased because of this improved thermal endurance.

2. Greatly increased service life in the same size and weight where it is necessary or desirable to maintain present temperature limits.

3. Increased ambient temperatures which reduce limitations as to operating locations.

Recently developed Silicone resins and varnishes have tremendously better thermal endurance than any of the known resins and varnishes. New high temperature insulations have been developed utilizing these materials. As a result, it is possible to produce electrical equipment that has a much great-

(Concluded on page 722)

Keeping Up-to-Date on

Wage and Salary Stabilization

▸▸▸ IN THE MIDST OF more dramatic developments along the labor front, such as manpower priorities, employers must not overlook the almost month-to-month changes in wage and salary stabilization. Keeping up-to-date with War Labor Board and Treasury Department controls is one of the important services rendered by the Labor Relations Institute to its 7,500 members. Recent reports prepared by our Industrial Division on this subject have explained in detail four outstanding developments which further affect or restrict the employer's right to give increases.

These four changes in the wage and salary stabilization picture consist of the following developments:

1) Limitations on the percentage of new workers who may be hired above the minimum in the rate range.

2) A new procedure on general increases which preserves established differentials.

3) The development of a consistent policy on "fringe raises" by the Regional War Labor Boards.

4) Disclosure that Treasury-controlled executives, administrators and professional employees have a better chance for increases than had previously been expected.

In considering the following details, it is important to recall the factors which determine whether a given employee comes under the Treasury or the WLB. The Treasury Department has jurisdiction over workers who (1) earn salaries of $5,000 a year or more and (2) employees who occupy administrative, professional or executive positions. The War Labor Board controls all others.

I. Hiring Above the Minimum

The War Labor Board has amended its General Order 31 by restricting the number of employees who may be hired at rates above the minimum for a particular job classification. Under the old rule a company could hire employees at any figure within the rate range, provided the workers had the experience and aptitude to warrant a higher-than-minimum wage or salary.

Under the new regulation, which applies to all employers with 31 or more workers, only 25 per cent of the new workers within a yearly period can be paid above the minimum to start. The other 75 per cent may not

O. C. COOL, Director
Labor Relations Institute

be paid more than the bottom of the rate range for the job.

The percentage limitation is based on job classifications, and not on plant-wide personnel. For example, within the next year a company plans to hire 20 mechanics. The rate range for the job is 90c to $1.25. Fifteen of the new men (75 per cent) must be hired at the minimum, or 90c. The remaining five may be paid a rate anywhere within the range if they have the experience to back up the higher-than-minimum scale.

If less than four workers are hired in a single classification, *one* of these newcomers may be hired at a rate in excess of the minimum. For instance, if three stenographers are hired, and the rate is $25 to $35, one girl may be paid more than $25.

The obvious caution to be observed is this: don't squander your 25 per cent allotment on average or mediocre applicants. Workers who really deserve the differential above the minimum may come along *after* your quota has been exhausted.

Newly-hired employees to staff new departments or new plants are also covered in the new regulations. During the first year of operation, 50 per cent of the new employees of a new department or plant may be hired at rates above the minimum of the wage bracket for the classification. After the first year, only 25 per cent of the employees may be so engaged.

New job classifications are also provided for. In any new job classification where less than four employees are hired during the given year, *one* may be paid more than the minimum. Of course, job classifications and rates for new departments or new plants must be submitted for approval before they are put into effect.

II. Preserving Established Differentials

Under the new procedure, if the War Labor Board approves a new rate bracket, all employees covered by the range can be moved up without further approval, thus preserving established differentials—*provided the average rate does not exceed the midpoint of the new range.*

Here is how the new rule works:

An employer has 10 employees in a department. The rate range approved by the WLB is 60c to 80c. The midpoint of the range is 70c. The employer raises two employees from 70c to 75c, two from 65c to 70c, two from 62½c to 67½c, two from 60c to 65c and two from 55c to 60c. The average rate is now 67½c, which is less than the midpoint of the range—70c.

Only one figure in this instance (75c) exceeds the midpoint of the range. Because it is 5c over the midpoint, the nickel must be deducted from the individual worker's budget under General Order 31. The rest are below the midpoint, and need not be included as part of the merit and length-of-service increase budget.

III. Consistent Policy on "Fringe Raises"

"Fringe raises," as defined by the WLB, consist of such non-direct wage benefits as night-shift differentials, call-in pay, year-end bonuses, recruitment bonuses, suggestion bonuses, paid meals and sick leave plans, etc. All such benefits require WLB approval, depending in the main upon the practice in the industry. Once approved, they become an integral part of the wage structure.

Following, in detail, is the policy of the War Labor Board on the various "fringe" issues, as compiled by the Field Staff of the Labor Relations Institute.

1. *Night-shift differentials*—Unless the practice would be entirely new to your industry, the War Labor Board will approve applications for payment of a night shift differential. It has been the Board's policy to grant up to 10c an hour, or 10 per cent of the hourly wage, whichever is the higher, for the third shift, and 5c for the second shift.

2. *Call-in pay*—The regional Boards have adopted a general practice of granting pay *for not more than four hours* in cases where an employee has reported for work and finds that he is not needed.

3. *Year-end bonus*—If you paid a higher year-end bonus in 1941 than you did in '42 or '43, the Board will approve your request to go back to the 1941 amount—if you can prove that unusual circumstances prevented continuance of the 1941 rate in the ensuing years.

4. *Recruitment bonus* — Cash bonuses of $10 and $25 have been allowed by the WLB as rewards to employees who recruit new workers. While approval for such bonuses is not required in some areas, it is safest to take no chances. File Form One with your local Wage-Hour Division.

5. *Suggestion bonus*—No approval is needed on bonuses given for worthwhile employee suggestions which are actually used and which effect real savings. However, the plan must not function as a hidden wage increase, and the awards must not exceed the value of the contribution for which they are paid.

6. *Paid meals*—The WLB will seldom turn down a request for payment of a half-hour lunch period for workers who are engaged in continuous shift operations. It will also grant permission to pay for dinners in cases where the workers are required to work *three hours or more* beyond the normally scheduled workday.

7. *Sick leave plans*—These will be approved by the regional Boards, provided they are reasonable and do not constitute a hidden wage increase. But it is still a serious violation to pay for unused sick leave.

IV. Treasury Liberal with Raises

Despite rumors to the contrary, the Treasury has granted almost 80 per cent of all salary increases requested by employers, and nearly all salary rate schedules presented to the Salary Stabilization Unit have been approved—thereby making more merit increases available. In making this data public, Assistant Secretary John L. Sullivan also revealed that the net average increase given by the SSU since October, 1942, has been 14.2 per cent. These figures should reassure the employer who hesitates to seek salary raises on the assumption that the Treasury "would probably turn me down."

Salary increases will be considered by the SSU if requested for the following purposes:

1—*To correct inequities.* If WLB or SSU increases to one group of workers has thrown the wage relationships of other workers out of line, the SSU probably will make a correcting adjustment in the latters' salaries.

2—*To compensate for increased duties and responsibilities.* This does not mean added work, as is sometimes thought. It specifically applies to an enlargement of the employee's authority and supervision.

3—*To fill new positions.* The new Form SSU-2 must be filed for these.

4—*To reward merit and length-of-service.* These increases can be made automatically, without approval; if you have a regularly established plan in effect. In the absence of such a plan, you may request *individual* merit and length-of-service increases, on which the limitation is 15 per cent.

5—*To offset the rise in the cost of living.* Here, too, you can apply for relief, but you are limited to the "Little Steel" formula of 15 per cent.

6—*To compensate for overtime.* While the Treasury refuses to approve overtime payments to workers under its control, it does permit slight raises for those who have to put in many extra hours.

7—*To aid in the prosecution of the war or other special, demanding reasons.* Under this clause, if you find that you are losing key employees to higher-paying firms, you may ask the SSU for relief. While the latter disclaims the use of its offices for the purpose of controlling the flow of manpower, it will extend a helping hand if your case is justified.

Conclusion

In summing up these four major developments, it is worth noting that only one—the rule curbing employment of new workers at higher-than-minimum rates for the job—is in any sense restrictive. The other three improve or emphasize the employer's ability to secure constructive action from the stabilization authorities, provided the requests are reasonable and justified by conditions.

Rating of Electrical . . .

(Continued from page 720)

er thermal endurance; as high as twenty to one on laboratory tests.

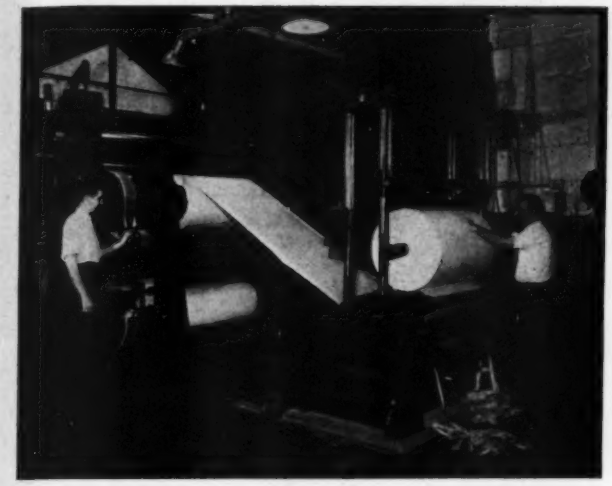
The Silicone materials bridge the gap between conventional organic insulating materials, which are limited with respect to heat stability, and ceramic type materials, which are not limited with respect to heat stability. Physically, they are quite similar to conventional resins, varnishes, and organic structures, but differ in that they do not readily decompose at temperatures of the order of 200 C. In actual use, the conventional insulating structures have been modified to incorporate Silicone resins throughout. This results in an integrated line of insulating materials which will withstand abnormally severe operating temperatures.

Over two years' experience on actual equipment confirms extensive laboratory tests which showed these materials to be promising. For example: To meet a very special requirement, a 3-hp. totally enclosed induction motor was redesigned for 10 hp. with no increase in weight or size. Since then, more than 30 similar motors using high temperature insulation have been built. These motors are now being tested under various conditions.

A 250 kva generator with high temperature insulation was operated in the laboratory for about 3,000 hours at 250 C. with no ill effects to the insulation. According to the best available means for interpreting accelerated life tests, this should be equivalent to far more than normal life expectancy.

High temperature insulation on several hundred operating coils for magnetic contactors overcame a serious burn-out problem resulting from excessive temperature within the control box. Operating for more than a year without a single failure is the record for Silicone insulation as contrasted to coils failing within a year for conventional insulation. Air cooled transformer life has been increased and output improved when insulated with high temperature materials. Several hundred are now in service.

Where temperature, or size and weight as determined by temperature, are important factors in electrical equipment design, the problem should be examined in the light of these recently developed insulating materials. Silicone insulations should not be considered a panacea for all insulating ills, but instead, should be applied to specific applications where its use is justified.



SYNTHETIC RESINS *in the Paper Industry*

F. G. FELSKE, Resinous Products & Chemical Company

▸▸▸ NEW SYNTHETIC RESINS increasing paper wet strength as much as ten times and now proving of wide interest to the fields of toweling, frozen food pack, sensitized paper, bag and wrapping papers and cloth substitutes, promise to go far toward enabling the paper industry to make use of less expensive and more readily available pulps. Similar resins added to starch to improve the water resistance of the glue line and increase the wet bursting strength of solid fiberboard already have gone into many millions of square feet of fiberboard for Army and Navy overseas supplies.

Known as the Uformites*, these resins are produced as dry water-soluble powders, as aqueous solutions, as modifications soluble in ethyl alcohol, butyl alcohol, octyl alcohol and hydrocarbons and are valuable not only to the paper field, but also as plywood adhesives and in baking finishes for metal and wood.

As early as 1920, a number of glue-like reaction products made with an excess of formaldehyde and without the addition of a condensing agent were announced. This material was found to be highly adhesive, a good binder for fillers, an impregnant for fabrics and capable of hardening under heat. From this early start, the Resinous Products & Chemical Company has developed and sold for many years specially designed aqueous and solvent type urea formaldehyde resins. One of the more important of recent developments has been achieved in the sizing of paper. Urea resins properly introduced and "cured" in the sheet produce the valuable effect of high wet-strength, leaving other characteristics substantially unchanged. Paper so treated may be continually wetted without losing its customary mechanical strength.

Among the more recent of these resins is Uformite 466, specifically designed for application at the wet end of the paper machine. It is supplied as a 50 per cent solution which is infinitely dilutable with water. This characteristic allows it to be uniformly dispersed throughout the stock in the beater, machine chest, or head box. Under the influence of alum, the resin is retained by the fiber to a degree not attained in conventional urea formaldehyde resins. After drying, the finished sheet shows vastly improved wet strength and considerably improved dry physical properties as well.

This Uformite requiring no additional processing or processing costs, possesses a number of advantages which may eventually prove highly significant. The reduction of beating time, the use of less expensive and more readily available pulp, and expanded application of specialty papers are all possibilities suggested by the unique properties of the resin.

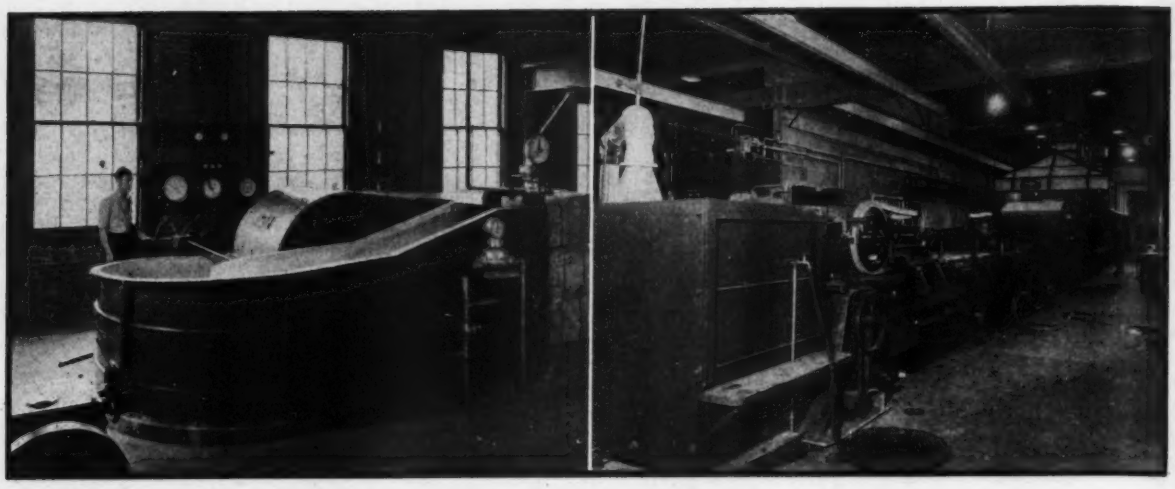
To effect complete dispersion, the resin is generally diluted with water to 25 per cent resin solids before adding to the stock. However, in certain cases, this Uformite is added directly without dilution. When it is desirable to dilute the resin prior to addition to the furnish, the temperature of the diluting water is never lower than 50 Fahr.

Since mechanical action such as may be received in the beater, Jordan or fan pumps shows no adverse effect on retention, Uformite 466 is added to the stock at any convenient point on the wet end of the paper machine. However, direct beater addition is highly preferable, particularly when treating sulphite stocks. In treating kraft stocks, the advantage in beater addition over addition at points closer to the wire is not as noticeable in terms of ultimate physical properties, but a greater percentage of the potential wet strength will be developed on the paper machine if the former method is employed.

A number of mills have adopted the procedure of adding Uformite 466 to the beater shortly after charging. Other materials, such as rosin size, starch, pigments, filler and alum are normally added after the resin—although there is no apparent difference in effectiveness when this procedure is reversed.

In common with all urea formaldehyde resins, the reaction which causes the resin to attain its insoluble, cured condition is a function of concentration, *p*H, time and temperature. Of the four, *p*H is probably the most important, since machine drying condi-

(*) Uformite is the trade name for the urea-formaldehyde resins of the Resinous Products & Chemical Company.



tions are generally inadequate to effect complete cure. For this reason, it is advisable to allow the paper to age a few days before testing for wet strength. An indication of ultimate wet strength is obtained by placing samples of treated paper in an oven for ten to twenty minutes at 220 Fahr.

Alum appears to be specific in Uformite application. It not only functions as a catalyst but increases resin retention. Thus, for optimum results, the *p*H of the stock should be reduced with alum to 4.3 to 4.8. The alum addition may be made either prior to or after the addition of the resin.

Although the resin imparts substantial gains in wet strength to stocks with *p*H values up to 5.5 slight sacrifices in efficiency have been noted. In certain types of absorbent paper, such as toweling, the quantity of alum required to reduce the *p*H to the range of 4.3 to 4.8 is undesirable. In such cases, the maximum permissible quantity of alum is used and hydrochloric acid is added to the stock. When this procedure is followed, wet strength essentially equal to that obtained with alum alone is developed.

The data below, based on machine trials at the New York State College of Forestry indicate the results now being obtained with the resin in commercial use:

These data, indicating the marked increase in both dry and wet tensile properties suggests applications not only where high grade base stocks are available and maximum strength characteristics are necessary, but also application where inferior and less expensive pulps are used, and it is desirable to obtain properties comparable to those of higher grade pulps. This resin also imparts definite improvement in wet tear, wet rub, and will increase fold endurance in certain types of paper, while dry tear properties remain essentially unaffected.

Commercial studies reveal that this resin finds its most effective use in the treatment of kraft and sulphite stocks. Rag, soda and groundwood will show improved wet treatment, but the increment may not be as great as that obtained with the former types. Particularly in the case of sulphite, the degree of hydration affects the wet strength efficiency of the resin.

	Uformite 466 (d) (per cent)	Tensile (a)		Rosin size (d)	Wet strength as per cent of dry
		Dry	Wet		
I Waterleaf kraft furnish	0	15.9	1.42(b)		9
	1	17.0	3.28(b)		19
	3	18.68	5.09(b)		27
II Rosin sized kraft furnish	0	14.47	2.20(c)	1.5	15
	3	16.52	5.34(c)	1.5	32
III Waterleaf sulphite furnish	0	13.01	1.05(b)		11
	3	14.91	3.66(b)		25

(a) All tensile values are expressed as pounds per inch width strip. All samples were aged 14 days before testing.
(b) Wet tensile determined after a 20-minute soak in tap water.
(c) Wet tensile determined after 1-hour soak in tap water.
(d) Per cent Uformite 466 and rosin size is based on bone-dry fiber weight.

Care is exercised to segregate all dry broke. Wet broke, of course, requires no special attention and may be returned to the beater for normal treatment. Dry broke should be returned to the beater or Hydrapulper as soon as possible, since the older the broke, the more difficult the defibering operation. The method found to be most effective in mill practice for defibering wet strength paper requires the use of elevated beating temperatures and acid conditions. The temperature in the beater or Hydrapulper is maintained in the range of 140 to 160 Fahr. and the *p*H of the stock is reduced with alum to 4.4 to 4.8 for best results. Cooking equipment has been satisfactorily used to treat wet strength broke.

The resin is also applied at the dry end of the paper machine by such methods as tub, spray, saturator, or other systems whereby 100 per cent retention is obtained. Because of its solution stability and freedom from precipitation on dilution—even in the presence of catalysts, its use in tub application is suggested where maximum economy is required.

The tub solution is prepared by merely diluting to the desired concentration, normally 4 to 12 per cent, and adding the predetermined quantity of catalyst. The actual solids concentration will depend upon the degree of wet strength desired, the absorbency properties of the sheet to be treated, the speed of the machine and other factors.

The catalyst concentration varies with the concentration of the Uformite, the temperature of the treating solution, the drying conditions of the machine, and the stability required.

Once the tubbing solution has been prepared, the characteristics of the machine and sheet will dictate application conditions. Temperature of the

tubbing solution, speed, and roll pressure will depend on weight, hydration and sizing of the sheet. In general, it is advisable to use the least amount of resin possible, and to minimize surface effects as completely as possible. The greater the degree of hydration in the original sheet, the more marked the extent of wet strength development. Hard sized sheets are more difficult to impregnate uniformly, and in such cases care is exercised to adjust machine speeds and press rolls to a point where maximum penetration will be achieved.

It is often necessary to minimize the stiffness produced in a sheet treated with the resin. Glycols, invert sugar and other humectants help, but none of them are entirely successful in plasticizing such a sheet. Soft sheets can be prepared, however, if the proper precautions are observed in the beater room and at the size press. In brief, plasticizing is obtained by using a combination of factors familiar to the papermaker rather than by simply adding any unique chemical.

The successful use of Uformite 500 resin-fortified starches in the manufacture of waterproof glues for weatherproof solid fiber V-box manufacture is fairly well known. The presence of the resin serves to improve the water resistance of the glue line, but nothing is more important to successful V-box manufacture than the use of plies or components which have been waterproofed as highly as possible. The glue line on a weight basis is but a small part of the board. Increases in the waterproofness of this line are not necessarily reflected in resistance to wet ply separation in boxes made from poorly sized or waterproofed components.

This Uformite 500 is a tan, free flowing, urea-formaldehyde powder offering a number of advantages over liquid types, particularly in storage characteristics and over transportation cost per pound of dry resin. The resin requires the use of a catalyst such as ammonium chloride. For one reason or another, ammonium sulphate or diammonium phosphate may be preferred, and they offer no difficulties.

The use of resin-fortified starch adhesives in the manufacture of corrugated board is closely related to their use in the lamination of weatherproof solid fiber. However, the corrugated adhesive must be more highly water resistant to withstand prolonged immersion without failure at the glue line. The open construction of the corrugated box allows immediate direct attack as compared with solid fiber which through the good water resistance of the liners gradually subjects the glue line to moisture. Thus it becomes doubly important that the Uformite-starch adhesive develop maximum efficiency under normal application conditions. Proper balance between Uformite and catalyst concentration as well as the temperature of application must receive every attention.

This type of Uformite glue is used not only in paperboard manufacture but also in plywood manufacture. In any application the catalyzed soluble glue is an unstable mixture and eventually reacts to produce an insoluble water-resistant mass. An uncatalyzed mixture is perfectly stable. Thus, addition of the catalyst is not made until the glue is certain to be used immediately. Reaction speed is directly proportional to temperature. Hot glues mean short-lived glues, and a pasting temperature below 130 Fahr. is preferable. Similarly, water resistance of the glue line will develop much faster in summer than in winter. For this reason some mills use preheated liners and chips.

The illustrations accompanying this article are of semicommercial papermaking equipment at New York State College of Forestry, Syracuse, New York, where original machine trials of Uformite were made.

Returning Veterans . . .
How Are You Going to Handle Them?

▶▶▶ Service men will be returning in increasing numbers to reclaim their old jobs or to seek new jobs. It may not always be easy to adjust these returning veterans to jobs in industry.

Foremen can do more than anyone else to help a veteran over this difficult re-adjustment period. The first few days, weeks, and months back on the job will undoubtedly be the most critical period of adjustment.

As a supervisor you should be giving considerable thought to how you are going to handle these returning veterans. A few wrong steps on your part may have a marked effect on the ex-service man. Your first interview with the returning veteran, the way you introduce him to other workers and to his particular job, and the follow-up you give him during the first days and weeks, will be very important. As the supervisor you are the one who knows the most about the jobs in your department—what they require in the way of output and service from the worker. You know the physical and the mental requirements on the job. You know the working conditions, the hazards, and the particular problems which are involved. In fact, your relations with new employees is always an important factor, but with regard to returning veterans they become even more important.

You will want to make every effort to make the returning veteran feel at ease. You should handle the first interview in a friendly fashion and ask such questions as are necessary to help in placing him on the right job.

Probably it would be a good idea to give your present employees, with whom the new man is to work, some instructions as to how they might best act toward him, in order that he may feel as little out of place as possible. Follow up the veteran at short intervals to see how he is getting along. Help him in every possible way and encourage him to ask questions and feel free to come to you about his personal and job problems.

You will need to check up closely to determine what training and instruction is necessary. If the veteran has previously worked for you he should be treated somewhat differently from a brand new employee. However, he should be brought up-to-date on any changes in policies, practices, or methods which have developed since he went into service.

It is a good idea to ask the returned veteran for his suggestions and his impressions after he has become reacquainted with the job. There will be some veterans returning from service and seeking employment who have never worked in a factory before. These men need even more attention to get them adjusted to industry.

Some difficulties may arise from misunderstanding. As a supervisor you will want to take every means for clearing up such misunderstandings before they become serious. If the returning service man does not fit into the first job to which he is assigned he should be transferred. A careful study should be made as to why he does not fit into the first job and a second job chosen which eliminates these causes.

Some of the returning service men will be physically handicapped. You should realize that these handicapped men, if properly placed, are not really handicapped unless this develops into a mental handicap. If a man's mental attitude is right, his physical handicap generally is not so serious.

We owe a great debt to these returning veterans. We should do our utmost not to "let them down."

(From "Management Information," published by Elliott Service Company, New York City.)

"The Story of Mechanical

Fig. 1—Using the Lowther "C" saw for felling; making the undercut. . . . Fig. 2—Same saw used for bucking. . . . Fig. 3—The "Kut Kwick" pulpwood saw. Low model for felling. Power AK Wisconsin air-cooled engine. . . . Fig. 4—Woods operation showing use of log jack and Mercury-Disston saw. The purpose of the log jack is to prevent saw pinching. . . . Fig. 5—Using the "Mall" chain saw for felling. . . . Fig. 6—The Atkins-Hassler Electric Power Saw being used for felling and bucking. . . . Fig. 7—Views of Allen Portable Pulpwood mill. All power from Ford-Ferguson tractor. Swing saw and loader built onto tractor. Log feeder conveyor attached to tractor. Log cross haul loader attached to conveyor. . . . Fig. 8—A pulpwood loader built on truck. Power to winch by power "Take off" from truck motor. Winch operation controls directly back of cab on right-hand side. . . . Fig. 9—A

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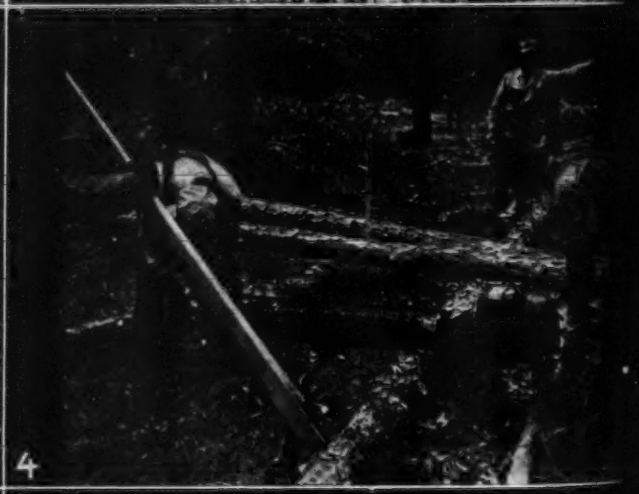
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Pulpwood Production"

trailer brow or yard. Upright stakes on trailers to facilitate sling or cable unloading at mill. Wood this type operation hand loaded. . . . **Fig. 10**—Loader handling 16 ft. pulpwood logs skidded to loader by crawler tractors and "Carco" arches. Truck load approximately 3 units of 180 cu. ft. . . . **Fig. 11**—Crane unloading 16 ft. pulpwood logs in mill yard. . . . **Fig. 12**—Slasher mill and conveyor to barking drums.

(These pictures reproduced through the courtesy of American Pulpwood Association. Pictures were taken at the following mills: Nos. 1 and 2, Gaylord Container Corp., Bogalusa, La.; Nos. 3 and 9, Brunswick Pulp & Paper Co., Brunswick, Ga.; No. 4, Brown Paper Mill Co., West Monroe, La.; Nos. 5 and 8, Southern Kraft Division, International Paper Co., Camden, Ark.; Nos. 6, 10, 11 and 12, Chesapeake-Camp Corp., Franklin, Va.; No. 7, Florida Pulp and Paper Co., Pensacola, Fla.)

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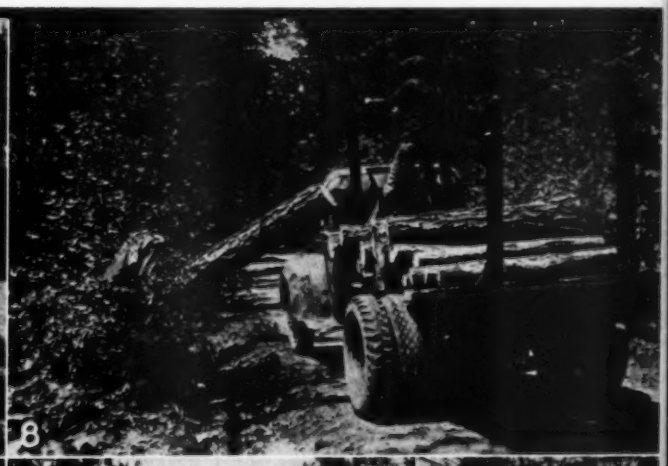
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Paper Machine Production Rate Nomograph

D. S. DAVIS, Wyandotte Chemicals Corporation

▶▶▶ TO DATE, slide rules (3) and alignment charts (1, 2) for calculating paper machine production have been confined to but one ream definition, that is, one combination of length and width of sheet and ream count. The accompanying nomograph covers a wide variety of ream definitions, is specific for ten combinations of dimensions and count, and is based on the equation,

$$P = \frac{0.005\ B\ w\ v}{A'}$$

where P = production rate, thousands of pounds per hour

B = ream weight, pounds

w = trim or deckle, inches

v = machine speed, feet per minute

and A′ = area of the ream, square feet. (A′ depends on the definition of the ream and is found by multiplying the product of the ream dimensions, each in inches, by the number of sheets and dividing by 144.)

The chart is designed to obviate calculation of A′ for nine common ream sizes, in addition to the TAPPI standard, through the use of the gauge points, A to J, inclusive. The value of A′ need be computed only for instances of reams of unusual dimensions.

The use of the chart is illustrated as follows: What is the hourly paper machine production when wrapping paper of a ream weight of 100 pounds is running at 500 feet per minute when the trim is 120 inches? Following the key and the broken lines on the chart, connect 100 on the B scale with 500 on the v scale and note the intersection with the α axis. From the table note that wrapping paper corresponds to point D on the A′ scale. Connect point D with 120 on the w scale and note the intersection with the β axis. Connect the intersections on the α and β axes and produce the line to meet the P scale in the value, 10.4, indicating that the production rate is 10,400 pounds per hour.

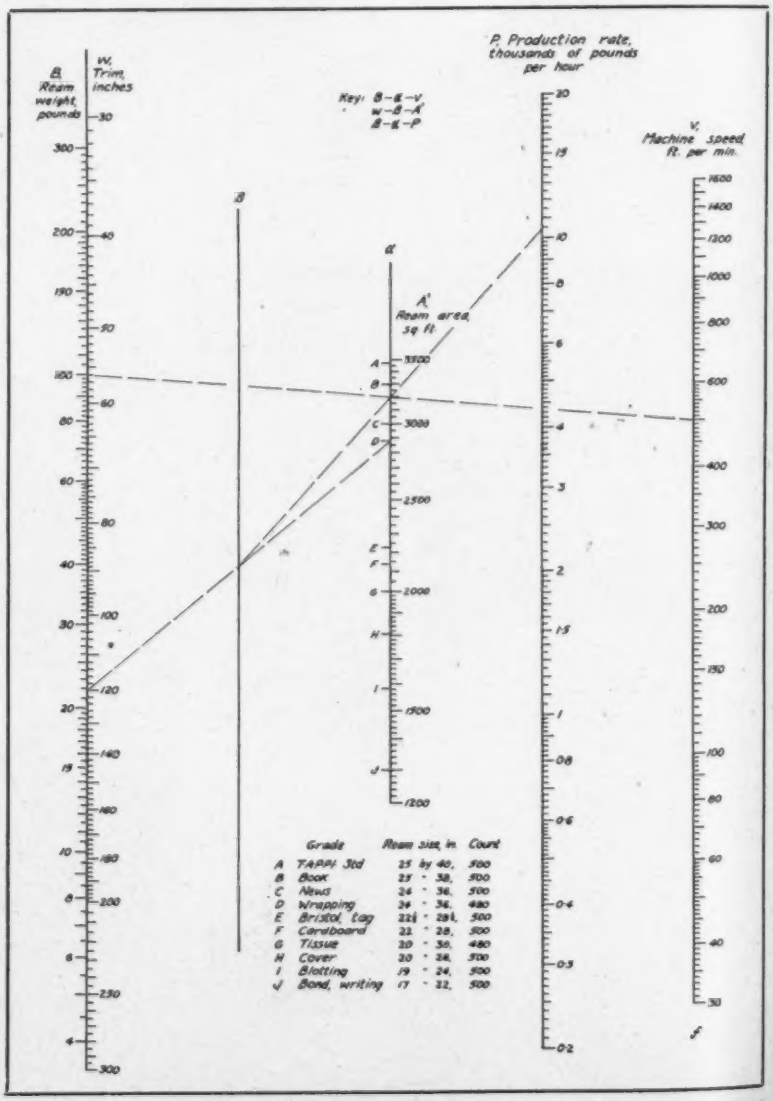
If the ream weight had been on the basis of the TAPPI standard (25 in. by 40 in., 500) instead of on the basis of 24 in. by 36 in., 480, with the other data unchanged, the rate of production can be shown to be 8,640 pounds per hour by tracing through the solution using the TAPPI standard point A in place of point D. The index lines for this illustration are not shown on the chart.

The chart can also be used to convert ream weights from one ream definition to another by using the *trim scale, w,* for ream weights with the β axis and the A′ scale. To illustrate: To what TAPPI standard ream weight does a 40-pound wrapping sheet correspond? Connect a ream weight of 40, read on the *w scale* with point D on the A′ scale, noting the intersection with the β axis. Connect this intersection with point A on the A′ scale and produce the line to the w scale where the desired ream weight is read as 48.2 pounds. To avoid crowding, index lines for this illustration do not appear on the chart. Conversion of ream weights from the TAPPI standard to any desired ream definition can be made in a converse manner.

Data for the ream definition table on the chart are from "TAPPI standards," T 410 m — 36 and TAPPI Data Sheet No. 80, Jan. 1943. The nomograph was constructed by methods described previously (4).

Literature Cited

1) Canadian Pulp and Paper Association, *Engineering Data Sheets,* p. 8, 1941.
2) Davis, D. S., *Paper Trade J., 94* (2) 31 (1932).
3) *Idem, Paper Ind., 19,* 298 (1937).
4) *Idem, Empirical Equations and Nomography,* 1st ed., Chap. V; McGraw-Hill Book Company, Inc., New York, 1943.


B, Ream weight, pounds
W, Trim, inches
P, Production rate, thousands of pounds per hour
V, Machine speed, ft. per min.
A′, Ream area, sq. ft.
Key: B–α–V
w–β–A′
β–γ–P
Grade | Ream Size, in. | Count
A TAPPI Std | 25 by 40, | 500
B Book | 25 " 38, | 500
C News | 24 " 36, | 500
D Wrapping | 24 " 36, | 480
E Bristol, tag | 22½ " 29½, | 500
F Cardboard | 22 " 28, | 500
G Tissue | 20 " 30, | 480
H Cover | 20 " 26, | 500
I Blotting | 19 " 24, | 500
J Bond, writing | 17 " 22, | 500

Filtration of Sulphite Acid

ARTHUR E. ERICKSON, Chemist, Pulp Div.
Weyerhaeuser Timber Company

▶▶▶ FILTRATION OF sulphite acid is one of the many precautions that may be taken to reduce the dirt count of pulp. There is also evidence of improved pulp quality due to the removal of sulphur.

The appearance of any paper sheet is better when dirt specks are few, and in some papers, dirt presents a very practical problem. The means used for keeping the dirt count at a minimum can be classified into the two following general groups: (1) dirt prevention and (2) dirt removal. The latter is accomplished through the use of riffers, screens, chemical cleaning, etc., and while very helpful and important this method has limitations. The former is by far the more efficient and effective of the two.

Dirt prevention requires, in addition to clean equipment, the use of clean raw materials insofar as possible and then further purification when practical somewhere along the process before entry into the pulp system. Wood, after careful mechanical cleaning to the limits of practicability, cannot be improved. Materials in the fluid state, such as water, bleach liquor and sulphite acid can, however, be cleaned by filtration. This paper is concerned with the filtration of sulphite acid at the Longview mill of the Weyerhaeuser Timber Company, Pulp Division.

Various types of acid filters are in use at different mills but in this case the acid filtration is accomplished through the use of four 8.5 feet by 8.5 feet filter beds of the gravity type. The beds are of conventional structure, having 15 inches of gravel and 24 inches of sand. The bottom drains are tile. A concrete floor above the filter beds encloses them to prevent the escape of SO_2 gas. For access to the beds and for observation of operation, each has a hatch with a water seal cover and a glass inspection plate. A vent line from the gas space above the bed to the low pressure side of the burner gas fan prevents development of any abnormal pressures which might be caused by the rise or fall of the acid or backwash water level above the sand. The volume of gas thus vented off is not sufficient to cause an appreciable drop in SO_2 content of the acid.

Three filters have sufficient capacity to handle the acid plant production, which is 14,000 gallons per hour at maximum rate and averages 13,000 gallons per hour. The fourth filter, which is out of service for backwashing, is not again put into use until another bed requires washing. Approximately 20,000 gallons of water at a rate of 685 gallons per minute are used in backwashing a filter bed. Normally, a filter bed requires backwashing after nine hours of service. There is, however, a type of limerock bearing a large amount of mica which may cause the filter bed life to drop off to three hours. There is also the possibility that limerock from other sources may introduce still different factors having an influence upon the length of filter service between backwashes. For this reason, it would seem that before the installation of an acid filtration system, it would be advisable to carry out experimental work to determine the filtration characteristics of the acid in question. This could be accomplished by constructing a small filter of approximately one square foot area and filtering acid made with the type of limerock that is to be used.

In the preparation of sulphite acid in this plant, the raw materials are deep well water, limerock and sulphur. The deep well water, which is used because of its uniformly low year around temperature, carries some sand. The limerock also adds sand to the acid system as well as some very finely divided rock particles and in some cases considerable amounts of small flakes of mica. The sulphur when burned, may, in its gaseous state as sulphur dioxide, carry minute quantities of sublimed sulphur. While this does not create a dirt problem, it is a possible cause of a very disturbing situation which will be considered later.

Roughly one-third of the dirt introduced into the acid system with the raw materials is removed by settling. Practically all of the remainder is eliminated by filtration. The following figures illustrate what is accomplished by filtration:

	Per cent
Total dirt in Jenssen acid	0.0293
Total dirt after settling basin	0.0201
Total dirt after filters	0.0006

On the basis of 13,000 gallons of acid per hour, 32 pounds of dirt are removed each hour, one-third by settling and two-thirds by filtration.

Since this mill has always had filters, a basis for comparison for definite evaluation of the benefits of acid filtration with respect to pulp cleanliness is lacking. However, of the 24 pounds of dirt removed each hour by filtration, a large percentage has a very small particle size and none has sufficient density for removal by the settling basin. Dirt with these characteristics does not lend itself to effective removal by screening or riffling. It would, therefore, seem reasonable to assume that much of this dirt would be carried on into the finished pulp, if it were not filtered out of the acid.

As mentioned previously, free sulphur in the acid was the probable cause of considerable trouble. That this difficulty is eliminated by filtration was brought out quite clearly in the article "Unbleached Sulphite Pulp from Western Hemlock" (G. H. McGregor, W. N. Kelly, and H. R. Heuer, *Paper Tr. J.*, 104, No. 4:31-40, Jan. 28, 1937). It is pointed out here that when changing from pulp of low bleachability cooked at higher temperatures to pulp of reasonably high bleachability cooked at lower temperatures, the normally expected rise in pulp strength did not develop. This trouble was encountered at a time when the Jenssen acid was being filtered previous to passage through a pressure tower where it again made contact with burner gas which might be carrying sublimed sulphur. Although repeated tests failed to disclose any free sulphur in the acid, the flow was changed so that it was filtered after its final contact with burner gas. This done, the pulp strength made the rise expected with increased bleachability.

Thus it has been shown that acid filtration is an important operation in the manufacture of sulphite cooking acid and one which has a direct bearing on the finished pulp quality. This is evidenced by removal of dirt, and improvement of uniformity of strength characteristics.

◆

The OWI states that the volume of Christmas packages going overseas to men and women in the Armed Services will reach a new high this fall. In 1943, the Army Post Office transmitted more than 20,000,000 holiday packages and an additional 75,000,000 to 100,000,000 pieces of miscellaneous mail.

PAPER SKETCHES

PRODUCED FROM 100 POUNDS OF WASTEPAPER IS SUFFICIENT TO MAKE ANY ONE OF THE FOLLOWING:
650 RATION "K" CONTAINERS
1470 EMERGENCY LIFEBOAT RATION BOXES
50 75-MM. SHELL CONTAINERS
200 BLOOD PLASMA CONTAINERS

THE TOTAL

VALUE OF THE PAPER MADE IN ENGLAND IN 1696 WAS ONLY £28,000 (EQUIVALENT TO ABOUT $140,000 IN AMERICAN MONEY).

HISTORY RECORDS

THAT THE ONLY MONEY NICHOLAS LOUIS ROBERT RECEIVED FOR HIS INVENTION OF THE PAPERMAKING MACHINE WAS THE EQUIVALENT OF $2,000 THAT WAS AWARDED HIM BY THE FRENCH GOVERNMENT.

THE ESTABLISHMENT OF THE COTTON INDUSTRY IN MASSACHUSETTS AFTER 1790 CAUSED AN EXPANSION OF THE PAPER INDUSTRY IN NEW ENGLAND.

JONES JORDANS

Engineered and accurately constructed for efficient performance.

GEARED FOR WAR PRODUCTION

Jones

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

ALLIED

H-S-P APPOINTS DABNEY ASST. MGR. OF SALES

A conference of sales executives was called on August 11 and 12 by H. A. Porter, vice president in charge of sales, of the Harris-Seybold-Potter Company, Cleveland, Ohio.

The highlight of this meeting was the announcement of the integration of Harris and Seybold sales under the direction of Mr. Porter. This change brings J. C. Dabney, sales manager of the Seybold Division, to the home office at Cleveland as assistant manager of sales of the company. He will continue to be in charge of the sales of the Seybold Division, in addition to his new duties connected with Harris.

Five years ago Mr. Dabney became associated with the company as Seybold Division sales manager. In this position he traveled extensively, contacting the trade throughout the country. He has a wide acquaintance in the industry and comes to his new position at the home office of the company with a background of understanding of graphic arts problems. During the war he has handled the contacts for the Division's war work. Prior to his affiliation with the company, Mr. Dabney had been a sales and marketing executive with the Standard Oil Company of Ohio, Cleveland.

During the meeting, sales and marketing plans of the company were studied at length with the objective of rendering all possible service to printers and lithographers in the postwar period. Marketing and organization plans for the future were outlined. The growth of offset lithography as a printing method and the rapid expansion of offset during the war period were discussed at length.

On August 20 Wm. Guy Martin, vice president in charge of the Western Sales District of the company, Chicago, and Maynard L. Mann, assistant to the president, left for the Pacific Coast to make a survey of market conditions and methods of operation. Mr. Mann recently made a similar survey in Texas. The West Coast survey will be made in connection with the sales integration policy, announced at the Cleveland meeting.

◆

LINCOLN AWARD PAPERS ARE ADDED TO LINCOLN LIBRARY IN OHIO U.

All papers submitted in the James F. Lincoln Arc Welding Foundation's $200,000 Award Program of 1937-38, and the Engineering Undergraduate Award and Scholarship Program of 1942-43, have been placed with the A. F. Davis Welding Library, in the Ohio State University, according to a recent announcement.

The library was presented to the University in 1942 by A. F. Davis, vice president of The Lincoln Electric Company, who was graduated in the class of 1914 with the degree of M. E. in electrical engineering. Mr. Davis selected the Ohio State University for the gift, because it was stated it is the only university in the country that offers a four-year course in welding engineering.

The papers now presented add substantially to the wealth of welding information in this collection.

◆

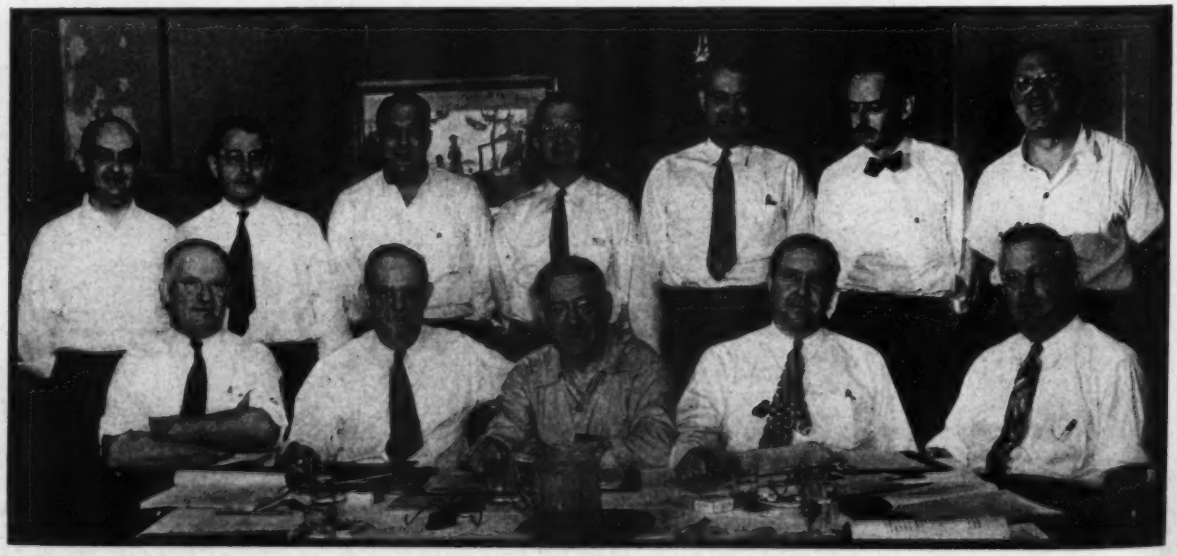
FAIRBANKS, MORSE BUYS POMONA PUMP

Fairbanks, Morse & Company, Chicago, has purchased the Pomona Pump Company, a division of Joshua Hendy Iron Works in a $4,000,000 transaction.

Announcements of the sale were made simultaneously in Chicago by R. H. Morse, Jr., general sales manager of Fairbanks-Morse, and in Sunnyvale, California, by Charles E. Moore, president of the Joshua Hendy company. The sale was effective as of September 2.

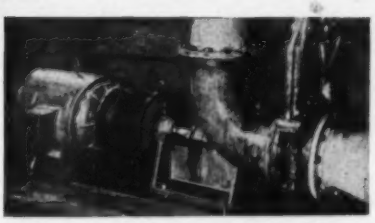
All physical assets, patents and trade-marks of the Pomona and Westco pump lines were included in the transaction. The Pomona firm has plants in Pomona, California, and St. Louis, and has been doing approximately 7 to 8 million dollars worth of business annually. With acquisition of this line, Fairbanks-Morse becomes the world's largest manufacturer of turbine pumps.

No changes in personnel are contemplated and, according to Mr. Morse, Arnold G. Brown, general sales manager of the Pomona company, becomes assistant manager of the Fairbanks-Morse Pump Division in charge of



Attending the Harris-Seybold-Potter conference of sales executives were: Back Row (L to R)—G. D. Baber, Horace R. Baker, Ben R. Perry, Louis R. Beck, A. S. Holford, M. L. Mann, Hedley Prout. Front Row—Wm. Guy Martin, J. W. Valiant, H. A. Porter, J. C. Dabney, and A. T. Walker.

PUTTING A PUMP IN ITS PLACE



FOR UNIFORM STOCK SUSPENSION

This elbow-type, propeller-type centrifugal pump shown as installed in a prominent Midwestern mill, was designed with low head and high capacity for circulation and agitation in diffuser chest.

*To Solve New Problems of "Wood Conversion" Call in a Worthington P. A. E.**

As new by-products, new processess — bringing new horizons to pulp and paper industries — are turning paper mills into the "wood conversion plants" of the future, millmen are calling on Worthington P. A. E.'s to solve their pumping problems.

What pump can handle this or that liquid without periodic costly shutdowns? *Where* and *how* should it be installed? What head, what capacity for this or that type of service? Worthington P.A.E.'s (their "rating" means longest, broadest experience with *all* types of process problems) are best able to advise you.

"Worthington Builds 'em All"

Troubled by corrosion? Abrasion? Heat? Viscosity? Solidification? Worthington offers *all* sizes and types of centrifugal pumps for pulp and paper processes. Ask a Worthington P.A.E. to recommend the right pump for you. Write us, or call our nearest district office. *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

WORTH BEHIND THE NAME WORTHINGTON

*P. A. E. — Pump Application Engineer

CP4-21

THE WORLD'S LARGEST MANUFACTURER OF PUMPS

Pomona and Westco products. Distribution and sales will continue under Mr. Brown's direction.

Hereafter the Pomona pumps will be known as Fairbanks-Morse-Pomona, and Fairbanks-Morse-Westco line.

◆

▶▶▶ NOW RELEASED for showing throughout the country is a Kodachrome sound film, "Only a Gasket." This gasket film has been made available by Goetzke Gasket & Packing Company, Inc., 17 Allen Avenue, New Brunswick, New Jersey, well known gasket manufacturer. The film is 16 mm. and runs about 35 minutes. The commentary is by Lowell Thomas. It is available to technical societies, manufacturing groups, colleges and other organizations. There is no charge for the use of the film, but application for showings should be made on official letterhead.

◆

▶▶▶ A NEW BRANCH OFFICE of The EIMCO Corporation is now located in the Paul Brown Building, St. Louis, Missouri. The office is in charge of James K. Russell. Executive offices and factories of The EIMCO Corporation are located at Salt Lake City, Utah.

▶▶▶ A NEW SALES OFFICE has been opened in Cleveland, according to announcement made by Dr. W. M. Billing, general manager of the Synthetics Department, Hercules Powder Company, Wilmington, Delaware. W. Wallace Trowell, of the Wilmington office, will be manager of the new branch office, and John L. Present, also of the Wilmington office, will serve as technical representative and assist with sales operations. The office will be located in the Union Commerce Building, Cleveland, and will handle Synthetics Department sales in Michigan, Ohio, western New York, western Pennsylvania, and Ontario, Canada.

◆

WESTINGHOUSE OFFERS ELECTRONICS COURSE

A new ten-part training course covering the basic principles and applications of Electronics in industry has been designed by the Westinghouse Electric and Manufacturing Company, Pittsburgh, for its employees. However, the material has been made available to others at reproduction costs because of many requests from engineering groups and individuals interested in Electronics.

The course is composed of sound slide films, lesson books, quiz books, and an instructor's manual. It is recommended that twenty hours should be allowed for the full ten-part course—two hours for each part, with classes held one night each week.

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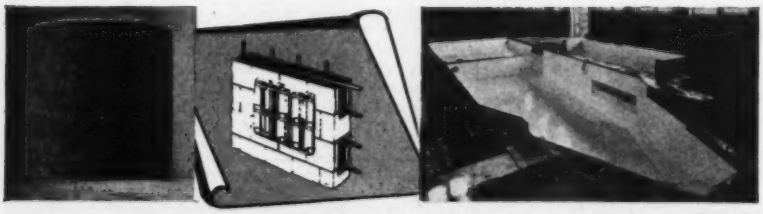
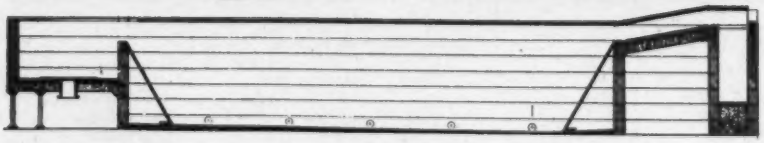
▶▶▶ A GENERAL SALES OFFICE was opened September 1 in Seattle, Washington, by The Monsanto Chemical Company, of St. Louis. C. F. Trombley is branch manager and will represent the company in all lines other than those of its recently-acquired I. F. Laucks properties. The new office is located at 911 Western Avenue, Seattle, headquarters of I. F. Laucks, Inc.

◆

▶▶▶ MORE THAN 9,809 extra car days were saved during a record 12-month demurrage-free period just completed by the East Pittsburgh Works of the Westinghouse Electric and Manufacturing Company. During the 12 months nearly 16,000 cars were loaded or unloaded at the East Pittsburgh Works without a single demurrage charge.





POST-WAR LININGS FOR PAPER MILLS

Save-all tanks, couch pits, storage tanks, etc. must provide long-time trouble-free operation to permit mills to operate successfully under post-war conditions.

The linings must be correctly designed and made of materials selected to meet the mills individual operating conditions.

For sixty years, Stebbins have worked closely with pulp and paper mill operators in designing, installing and servicing linings and tile tanks.

No other organization has devoted sixty years exclusively to lining and tile tank problems and no substitute has yet been found for experience.

Every installation is covered by a lump sum contract. When a lining or tile tank job comes up, consult Stebbins.

EIMCO

Stebbins Engineering and Manufacturing Company

EASTERN BOULEVARD, WATERTOWN, NEW YORK

ARMY-NAVY "E" AWARDS

Yale & Towne Manufacturing Company, Stamford, Connecticut—The award to this company of the Army-Navy "E" pennant—the highest military award for excellence in war production—brought forth the announcement of the amount of precision war products being manufactured at Stamford. Joined by several thousand relatives and friends, the 4,000 Stamford employees took part in the ceremonies that marked the celebration of this honor. Rear Admiral Wat T. Cluverius and Brig. General Thomas E. Troland made the presentation to W. Gibson Carey, Jr., president of the Y&T company. During the ceremonies the employees also presented to General Manager William R. Hoyt a large service flag in honor of the 829 former employees now in the Armed Forces and the eight who died in uniform. For its achievement the company was saluted over the national networks by Kate Smith and Guy Lombardo.

Third Star: Texas Gulf Sulphur Company, New York City. This company won its pennant November 2, 1942.

Fourth Star: Buffalo Pumps, Inc., Buffalo, New York. The "E" pennant was awarded this company October, 1942.

MORE THAN 50 DIFFERENT

PARACOL*

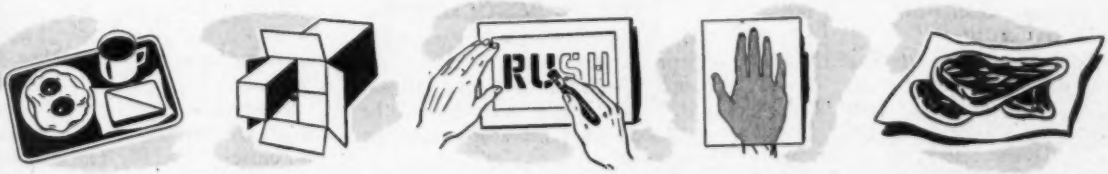
WAX EMULSIONS

for your papermaking problems

There are over 50 different emulsions in the Paracol series—each designed to answer effectively and economically specific types of papermaking problems.

Because of their wide range of properties, the Paracol emulsions permit virtually "tailor-made" selection. Choice of the correct Paracol is determined by many factors—involving where and how applied, and effect desired in the finished sheet.

Your PMC technical representative knows these many factors intimately—through our more than 15 years experience in making emulsions and applying them to papermaking problems. For further information on the use of Paracol emulsions in your operations, use the convenient coupon below.



WATERPROOF ★ GREASE RESISTANT ★ INK REPELLENT ★ TRANSLUCENT ★ BLOOD RESISTANT

Scores of paper mills throughout the country are using to their advantage the research knowledge and technical training of Hercules representatives. This helpful service is at your disposal for all your important papermaking problems.

HERCULES

CHEMICALS FOR INDUSTRY

*Reg. U. S. Pat. Off. PMC

HERCULES POWDER COMPANY
INCORPORATED

Papermakers' Chemical Department,
961 King Street, Wilmington 99, Delaware

Gentlemen:

My wax problem is.....

Please send me information on.....

Name.....Title.....

Firm.....

Address.....

PI-43

ASSOCIATIONS

OFFICES OF SUPTS. ASS'N NOW LOCATED IN NEW YORK CITY

The general office of The American Pulp and Paper Mill Superintendents Association, Inc., is now established at 220 East 42nd Street, New York 17, New York. All communications for the Association or the secretary-treasurer, George W. Craigie, should be sent to the new address.

The change was effected following the retirement of Robert L. Eminger, former secretary-treasurer, who maintained headquarters at 54 North Main Street, Miamisburg, Ohio.

◆

TWO MEMBERS OF NAM COMMITTEE ARE FROM THE PAPER INDUSTRY

The responsibility of management in the rehabilitation of veterans has been summed up by the National Association of Manufacturers in its appointment of a Committee on Supervisory Relations.

The foremost objective of this committee is the special training of foremen for the important role they must play in rehabilitation, particularly during the critical first few weeks of the veterans' change-over from military to civilian life.

Members of this committee chosen from the paper industry are: E. E. Grant, president, The Crystal Tissue Company, Middletown, Ohio; and H. N. Dowse, clerk of corporation, Dennison Manufacturing Company, Framingham, Massachusetts.

◆

NOTED AUTHORITIES TO PRESENT VIEWS AT CHEMICAL CONF.

Contributions of industrial chemical engineering to the various industries will be revealed by noted authorities at the National Industrial Chemical Conference to be held in conjunction with the third biennial National Chemical Exposition at the Coliseum in Chicago, November 15 to 19, 1944. Invitations have been extended to leaders in many phases of the chemical industry to present their views at the conference.

Sponsored by the Chicago Section of the American Chemical Society, the show and conference will be the most important of its kind ever held because of its wartime significance and also because of the vital part the industry is taking in helping to speed Allied victory.

The show and conference are designed, it is announced, to be of special interest to industrialists who realize that every manufacturing process involves chemistry in some way, as well as to research chemists, executives of industrial plants, engineers, bankers, production managers, plant superintendents, foremen, purchasing agents, government specialists and others who will be afforded the opportunity to make valuable contacts during the five-day period. Inquiries regarding the show and conference should be addressed to the National Chemical Exposition, 330 South Wells Street, Chicago 6, Illinois.

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▶▶▶ THE NEW ADDRESS of American Standards Association is 70 East 45th Street, New York 17, New York. The association moved from its former location at 29 West 39th Street to the new and larger quarters on September 1. The telephone number is Murray Hill 3-3058.

◆

"THE BOLTON AWARD" ANNOUNCED BY THE SUPTS. ASSOCIATION

The American Pulp and Paper Mill Superintendents Association, Inc., announces The Bolton Award, of $5,000 in U. S. War Bonds in a contest to be conducted under the auspices of the Association.

The Contest is open to all members of the Superintendents Association and to all non-member superintendents or foremen at present employed in North American pulp or paper mills.

The Bolton Award will be given for the best practical suggestions in articles not exceeding 1,500 words on any one of the following subjects:

"How to Promote Better Relations Between Workers and Their Immediate Foremen."

"The Part a Superintendent Should Play in Developing and Sponsoring Harmonious and Co-operative Employer-Employee Relations."

"How Can the Superintendent Encourage His Men to Suggest Ideas for More Efficient Operations?"

In the preliminary contest, the juries appointed in each of the Association's ten Divisions will receive from the secretary all entries originating in their respective divisional areas. Six prizes will be awarded in each Division. The ten articles therein awarded first prize will be entered automatically in the National Contest, to be judged by a jury of three appointed by the Contest Committee.

The prizes constituting The Bolton Award (all to be paid in War Bonds) are as follows:

Divisional Contest
(6 for each of the Ten Divisions)

1st Prize	$200
2nd Prize	100
3rd, 4th, 5th and 6th Prizes	25

National Contest (3 Prizes)

1st Prize	$500
2nd Prize	300
3rd Prize	200

The Contest will close January 1, 1945. All entries should be addressed to George W. Craigie, secretary-treasurer, The American Pulp and Paper Mill Superintendents Association, Inc., 220 East 42nd Street, New York 17, New York.

◆

BRIGHT OUTLOOK FOR POWER SHOW AND EXPOSITION

The present outlook for the 16th National Exposition of Power and Mechanical Engineering is definitely brighter than when it was first announced. The Exposition which is held every two years, will run from November 27 to December 2 next, in Madison Square Garden, New York City.

The principal reason for the brighter aspect of the Exposition is, of course, the accelerated progress toward industrial reconversion, stimulated by the upsurge of recent war events.

As heretofore, the Power Show will feature apparatus for the production, control, distribution and transmission of heat and power. There also will be displays of metals and other materials especially adapted to power plant and mill construction, alteration and maintenance; materials handling equipment; engineering specialties and laboratory equipment for research and for production control. With more spaces available than two years ago in the enlarged exhibit area at Madison Square Garden, the amount of unreserved space for allotment to applications now being received is considerably less than at the corresponding date two years ago. Charles F. Roth, president of the International Exposition Company, and manager of the Show predicts an exceptional buying interest.

NAM VIEWS

A special postwar supplement to the current *NAM News*, weekly organ of the National Association of Manufacturers, calls attention to the judgment of the Association's Board of Directors in launching its Committee on Distribution into a field heretofore untouched by the manufacturers.

The Board has formally resolved that "distribution and production are equally important parts of manufacturing, and the importance of distribution should be clearly and definitely recognized in the future work of the organization.

The work on which the *NAM News* publishes its current report, has led the Distribution Committee to a position which is stated as follows: "Since manufacturing during the War has demonstrated its capacity to produce goods far in excess of any prewar output, it seems self-evident that in postwar years distribution will be confronted with the challenge of getting products to consumers on a larger scale than ever."

◆

CONVENTIONS AND COMING EVENTS

September 14-16—Fall meeting of the Northeastern Division of the American Pulp and Paper Mill Superintendents Association at Poland Springs House, Poland Springs, Maine.

October 3-5—33rd National Safety Congress and Exposition at the Sherman, Morrison and La Salle Hotels, Chicago.

October 6-7 — Connecticut Valley Division of The American Pulp and Paper Mill Superintendents Association will hold a joint meeting with New England Section of TAPPI at the Wendell-Sheraton Hotel, Pittsfield, Massachusetts.

October 27-28—Annual meeting of the Southeastern Division of the American Pulp and Paper Mill Superintendents Association at the Poinsett Hotel, Greenville, South Carolina. (This meeting was formerly announced for Asheville.)

November 15-19—National Chemical Exposition at the Coliseum, Chicago.

November 27-December 2—The 16th National Exposition of Power and Mechanical Exposition, Madison Square Garden, New York City.

STATED MEETINGS

Technical Associations of the Pulp and Paper Industry.

Delaware Valley Section—First Friday of each month at the Engineers' Club, Philadelphia, Pa.

Kalamazoo Valley Section—First Thursday of each month, including June, at 6:30 P. M. at the Columbia Hotel, Kalamazoo, Mich.

Lake States Section—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Chicago Professional Paper Group

Third Monday of each month at Chicago.

American Pioneers

The first Light House in America was erected 1716 on Little Brewster Island at entrance to Boston Harbor. Partially destroyed in siege of Boston 1775 and rebuilt in 1783. Now called Boston Light.

Massachusetts has scored many "firsts" in American History. Boston Light for 228 years has faithfully warned and welcomed ships from the Seven Seas and guided the coastwise vessels. It was the first lighthouse in America, but since war was declared it has remained unlighted.

DRAPER BROTHERS COMPANY, while young as compared to Boston Light, was a pioneer in the manufacture of paper makers' felts in Massachusetts. We have survived three wars and will continue after this one with our lights and hopes undimmed.

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Woolen Manufacturers Since 1856

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OUR REPRESENTATIVES *to serve you*

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W. L. CAMPBELL, Savannah, Ga.
RALPH E. BRIGGS, Canton, Mass.
E. R. LELOFF, Vancouver, Wash.
WILLIAM N. CONNOR, Canton, Mass.

S A F E T Y

SAFETY CONGRESS WILL HAVE MILITARY ACCENT

The National Safety Council announces that the 1944 National Safety Congress, to be held in Chicago October 3-5, will be streamlined to do a wartime job.

The Congress program this year will be packed into three mid-week days and nights to avoid week-end travel. From start to finish, it will be given over to discussion of ways to prevent accidents which delay complete victory, and accident problems which loom as formidable postwar threats. Theme of the Congress will be "Dedicated to Victory."

Among safety problems to be considered at the Congress are:

1. The postwar traffic jam.
2. Finding safe and suitable jobs for wounded veterans.
3. Training and retraining able-bodied war veterans for their postwar jobs.
4. Providing built-in safety for postwar homes and safety education for the people who live in them.
5. Reduction of the farm accident toll that hinders production of food for freedom during and after the war.
6. Halting the rising child accident toll, especially among "war job orphans."

This wartime Congress will have a distinct military accent. Several hundred high ranking officers of the Army, Navy, and Marines will attend, and a large number of sessions will be devoted entirely to military accident prevention problems.

At a special Army session October 4 five generals will speak. Maj. Gen. Henry S. Aurand, commanding general, Sixth Service Command, will preside. Other speakers on the panel will be Maj. Gen. Archer L. Lerch, the provost marshal general; Maj. Gen. Levin H. Campbell, chief of ordnance, Army Service Forces; Maj. Gen. Jonathan W. Anderson, commanding general, XXXVI Army Corps, Fort Riley, Kan., and Gen. H. H. Arnold, commanding general, Army Air Forces.

Col. John Stilwell, president of the National Safety Council, will speak at the opening session of the Congress October 3, when members of the Council assemble for the annual meeting.

The annual Congress exposition of safety equipment and educational materials will be open daily on the mezzanine floor of the Sherman hotel. Congress sessions will be held at the Sherman, Morrison and LaSalle hotels.

Paper and Pulp Section

The meetings of the Paper and Pulp Section will be held in the Hotel Sherman; the opening session will be called at two o'clock Tuesday afternoon, October 3. Other regular sessions will be held Wednesday and Thursday afternoons.

A new feature of the program of the Section this year is that for the first time there will be a dinner meeting instead of a luncheon as in previous years. The presentation of N.S.C. trophies and certificates and the award of the Edward Benton Fritz Memorial Trophy will be made at the dinner meeting on Tuesday evening. Following the presentations there will be an open forum meeting.

◆

The Labor Management Committee at General Electric Company has adopted the slogan "Best Safety Device Is a Safety-Minded Worker," in a safety education program involving many subcommittee members.

1+1=3

HOW NAYLOR FABRICATION SERVICE GIVES YOU MORE FOR YOUR MONEY

Here's one way you can make 1 and 1 add up to 3. In changing pipe lines, add Naylor's Fabrication Service to Naylor Pipe and you get the EXTRA value in performance that means more for your money.

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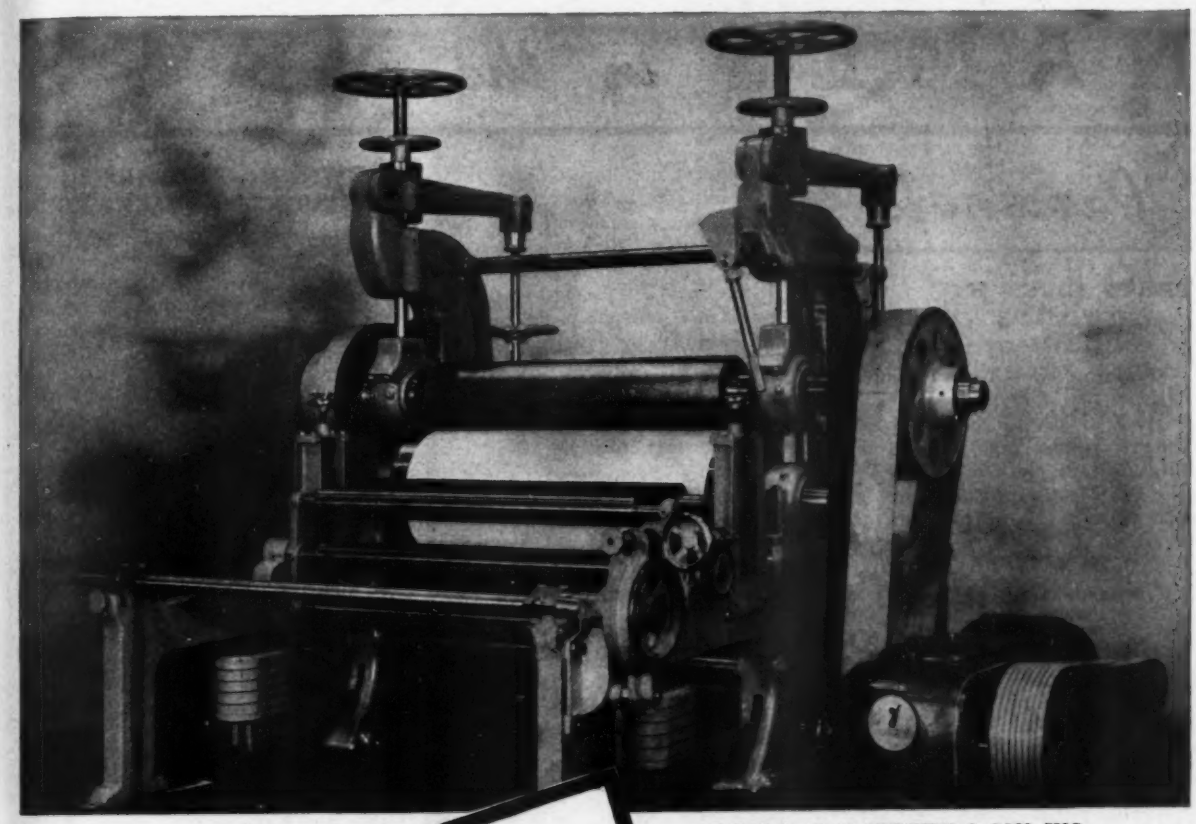

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SKF

BALL AND ROLLER BEARINGS

No calender can be better than the rolls in it, and no roll can be better than the bearing upon which it depends.

An outstanding example is this 15-ton Paper Embossing Calender, two roll, 48″ face, compound lever pressure and variable speed drive from 100′ to 400′ per minute.

On this machine, an SKF Spherical Roller Bearing on each end of the 9″-diameter rolls bears the brunt of heavy loads without binding . . . maintains equalized load distribution . . . sticks to the job throughout a long life.

In the production of precious paper, the thought in the minds of engineers in considering *machine* performance is *bearing* performance—always. 5633

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NAMES *in the* NEWS

Personals

PARTY GIVEN BY OLD-TIMERS' CLUB OF KIMBERLY-CLARK

Seven men who have a combined total of 300 years employment were present at a recent party by the Kimberly-Clark Corporation, Neenah, Wisconsin, for the Old-Timers' Club. The Old-Timers are made up of men who have had more than 40 years' service in the employ of the corporation.

The party, which was held August 22 in Telulah Park in Appleton (Wis.), is expected to become an annual event.

Fred Kranhold, who has been an employee for over 50 years, John Schiebler, William Kellett, and John Simonich, executives of the corporation, gave brief talks, and gifts were presented to the men.

The honored guests were William Neabling, steam engineer with more than 41 years of service; Julius Herzfeldt, a tour foreman in crepe wadding manufacture for more than 40 years; Louis Asmus, beater engineer, tour foreman, and cleanup man with more than 42 years of experience; Louis Anderson, crepe wadding manufacturing tour foreman with 44 years of service; George Casperson, crepe wadding machine tender with more than 44 years of service, having started as a cutter boy at the old Neenah mill; Fred Krablean, a crepe wadding beater engineer, with over 41 years of service; and Adolph Paulson, crepe wadding machine tender with over 47 years of experience.

◆

GEORGE L. BIDWELL RETIRES AS RIEGEL GEN. SUPERINTENDENT

The retirement of George L. Bidwell as general superintendent of the Riegel Paper Corporation, New York City, has been announced. Mr. Bidwell will continue to serve as vice president and in an advisory capacity.

Mr. Bidwell has been with The Riegel Paper Corporation since 1896, and is well known to papermakers throughout the country. He is the inventor of machinery and processes accepted and used in many mills. He was instrumental in introducing Glassine papers into this country thirty-four years ago, and in perfecting their rapid progress as an important packaging medium. He also has been particularly active in the development of processes for the manufacture of special rope and jute papers.

Fred I. Jacoby has been named to succeed Mr. Bidwell as general superintendent. He has been with the company since 1906. He was formerly superintendent of the Riegel mill at Milford, New Jersey, and until Mr. Bidwell's retirement was assistant general superintendent.

George L. Bidwell

◆

ONTARIO PAPER CO. PRESIDENT HAS 25 YR. SERVICE RECORD

At Thorold, Ontario, on August 15, Arthur A. Schmon, president and general manager of the company, was presented with a silver tray on behalf of the superintendents, department heads and managers of all divisions of the Ontario Paper and associated companies to commemorate his twenty-fifth year with the company.

Mr. Schmon joined the company shortly after his release from overseas service in World War I. He began as manager in charge of construction and operations at Shelter Bay, and has been advanced to the presidency which he took over in 1933. In 1938 he became president and general manager also of Quebec North Shore Paper Company, principal subsidiary of Ontario Paper Company.

EDWIN C. JAHN HAS RETURNED FROM SWEDEN

After spending more than a year in Sweden, Professor Edwin C. Jahn, returned to the States last month. Dr. Jahn is Professor of Forest Chemistry, New York State College of Forestry, Syracuse, New York, and Research Collaborator, U. S. Department of Agriculture.

While in Sweden, Dr. Jahn made a study of the pulp and paper situation in Sweden and Finland. He also visited England. While over there, the two following articles submitted by him were published in this magazine:

"The British Paper Industry's Part in Total War," November, 1943.

"Impact of the War Upon the Swedish Pulp and Paper Industry," June, 1944.

◆

▶▶▶ Until recently manager of sales of the American Engineering Company, Philadelphia, *Joseph S. Bennett* has been elected vice president of the company. He has been connected with the company successively as draftsman, assistant construction engineer, assistant mechanical engineer and manager of sales. He holds 31 patents in the United States and 106 patents including foreign countries.

◆

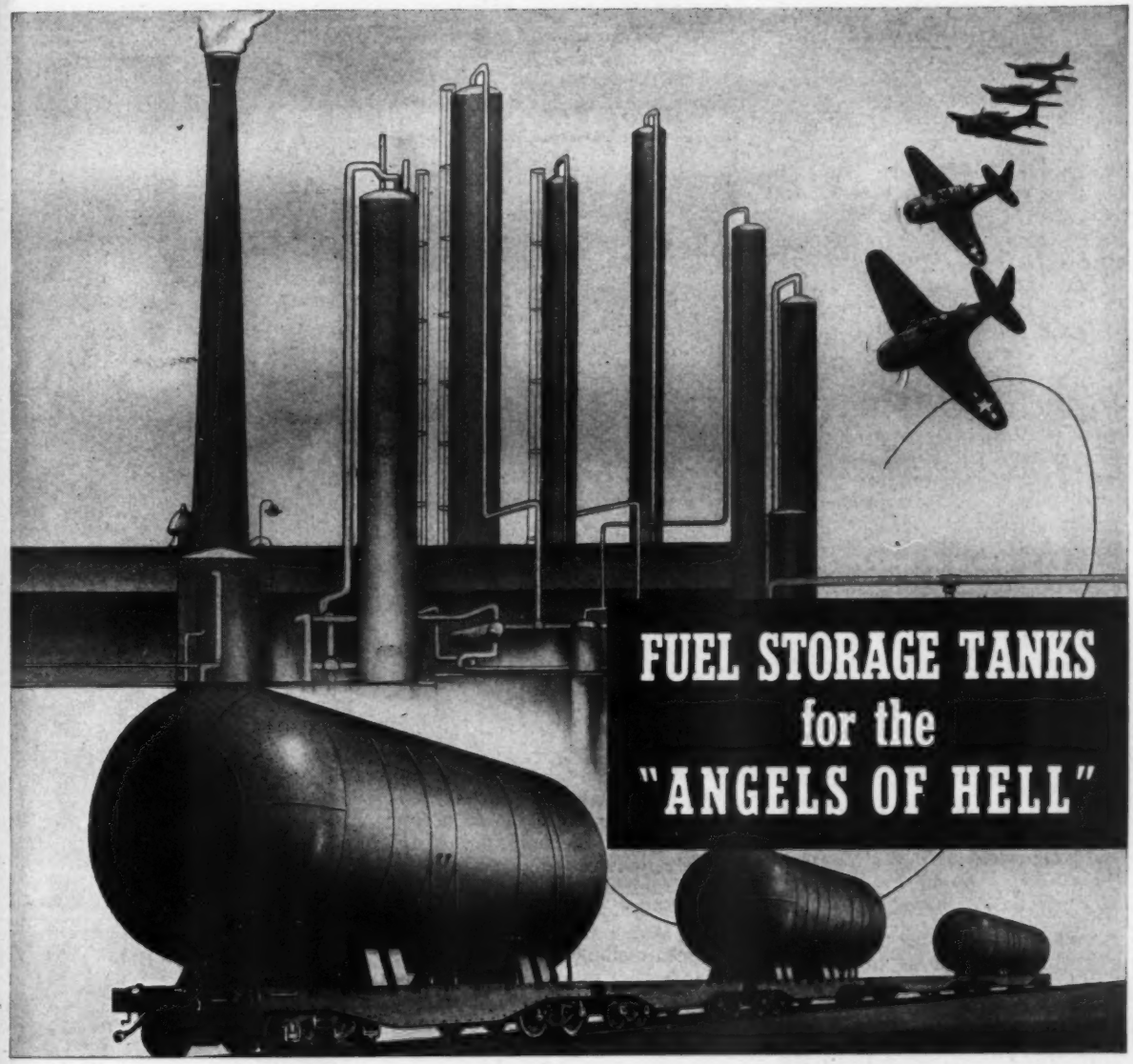
▶▶▶ As a recognition of important key work carried out in laying foundations for the invasion, *Lieutenant-Colonel H. Bruce McAdam* has been named in the King's birthday list as a member of the Most Excellent Order of the British Empire. Prior to his enlistment, the Lieutenant-Colonel was superintendent of the Quebec North Shore Paper Company, Baie Comeau, Quebec.

◆

DEAN HENRY S. GRAVES GIVEN FORESTRY MEDAL

At a meeting of the Washington Section, Society of American Foresters, held in the Cosmos Club, Washington, D. C., on August 1, Henry S. Graves, New Haven, Conn., dean emeritus of the School of Forestry, Yale University, was awarded the Sir William Schlich forestry medal for distinguished service to American forestry.

Dean Graves was head of the Yale School of Forestry from 1920 until his retirement in 1939. He served as chief of the U. S. Forest Service from 1910



High-octane flying fuel is being manufactured and stored in enormous quantities in welded pressure vessels made by General American. In every quarter of the globe, military and industrial experts recognize the GATX symbol as signifying quality. GATX-built equipment, backed up by GATX Know-How, can effect production economies for *you!*

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to 1920. At present he is chairman of the subcommittee on forestry and forest products of the United Nations Interim Commission on Food and Agriculture.

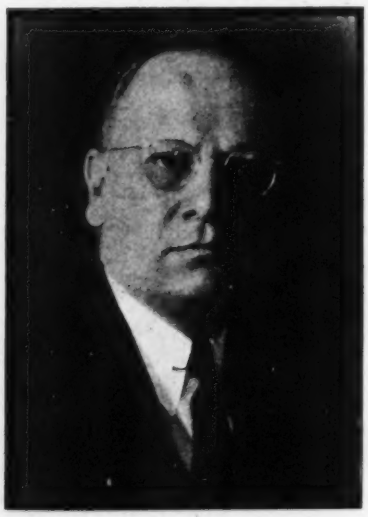
This medal has been awarded only twice before in the United States; in 1935 it was bestowed on President Roosevelt, an honorary member of the Society of American Foresters for his leadership in the forest conservation movement. In 1940 it was awarded to Gifford Pinchot, first president and Fellow of the Society, and first chief of the U. S. Forest Service, at the Society's 40th anniversary meeting.

◆

▶▶▶ The Labor Relations Institute, through its national director, O. C. Cool, announces that *Harold G. May* has been appointed regional director of the Institute's Management Engineering Division for the states of Michigan and Ohio. Mr. May will make his headquarters at the new Detroit office of the Institute in the Donovan Building, 2457 Woodward Avenue. He has been in charge of wage analysis and job classification activities of the Institute for the past 14 months, prior to which he operated his own company in the sales promotion field.

◆

▶▶▶ The new president of the John Waldron Corporation, New Brunswick, New Jersey, is *B. R. Newcomb.* He was formerly with the Worthington Pump and Machinery Corporation



B. R. Newcombe

and more recently with the American Optical Company. *S. N. Finney* and *F. W. Egan,* both long associated with the Waldron organization, have been elected vice presidents of the corporation.

▶▶▶ The appointment of *George J. Prager* as manager of its Paper Finishing and Converting Machinery Division has been announced by the Norwood Engineering Company, Florence,

George J. Prager

Massachusetts. Mr. Prager has been serving the paper field as a consulting engineer and is well known throughout the industry.

◆

▶▶▶ At the annual meeting of Pacific Mills, Ltd., Vancouver and Ocean Falls, British Columbia, *Paul E. Cooper,* formerly vice president and general manager, was elected president of the company. He succeeds A. B. Martin, of San Francisco, now chairman of the board. J. A. Young continues as vice president and treasurer, H. C. Pim as vice president, J. H. Lawrence as secretary, and A. G. McLennan as assistant secretary and treasurer.

◆

▶▶▶ Since August 15 *Harry Zinkil* has been district manager of the Pittsburgh Piping & Equipment Company, with offices in the Tower Building, Detroit. Formerly, Mr. Zinkil was with Crane Company and Taylor Supply Company, Detroit.

◆

▶▶▶ The appointment of *William Barclay* as vice president of the Powell River Company, Powell River, British Columbia, has been announced. Mr. Barclay has held a succession of important positions with the company, and for the past few years he has been manager of Powell River Sales Company, selling subsidiary of the Powell River Company. At present he is in charge of a housing development which has been undertaken by the company at Powell River.

▶▶▶ The election of *Edwin Stein* as president of the company is announced by Stein, Hall & Company, Inc., New York. Mr. Stein succeeds the late Frank Griswold Hall. He is the grandson of the late Solomon Stein, of Chicago, who founded the company in 1866. Mr. Stein served in the first world war; he was made executive vice president in 1942.

◆

▶▶▶ The appointment of *R. G. Wingerter* as assistant chief engineer for the industrial division has just been announced by The Timken Roller Bearing Company, Canton, Ohio. For the past six years, Mr. Wingerter has been an industrial engineer for the Timken company.

◆

▶▶▶ At a recent meeting of the board of directors of the American Engineering Company, Philadelphia, *Thurlow E. McBride* was made vice president of the company. Mr. McBride has been treasurer of the company, which office he continues to fill.

◆

▶▶▶ Formerly with the Australian Newsprint Mills, Tasmania, *Percy R. Sandwell* is now development engineer for the Ontario Paper Company, Thorold, Ontario.

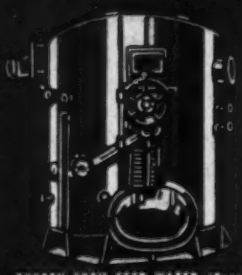
◆

▶▶▶ For many years executive vice president of J. O. Ross Engineering Corporation, New York City, *S. W.*

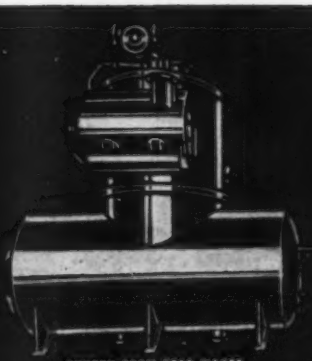
S. W. Fletcher

Fletcher has been elected president of that company and will continue to make his headquarters in New York. *A. E. Montgomery* will continue as vice president of the company with headquarters in Chicago.

AMMONIA


OXYGEN FROM FEED WATER (Spray)

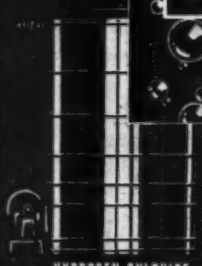
CARBON DIOXIDE


OXYGEN FROM FEED WATER (Spray)

COCHRANE EQUIPMENT FOR THE

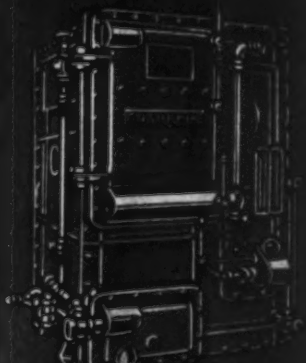
DEGASIFICATION OF WATER

OXYGEN FROM FEED WATER (Trays)


HYDROGEN SULPHIDE

OXYGEN FROM COLD WATER

SINCE 1885 Cochrane engineers have worked primarily to design and apply equipment for heating, degasifying, and chemically treating boiler feed water. Naturally, in acquiring the experience and data resulting from more than fifty years of such activity, problems have been encountered requiring equipment to condition and degasify water of unusual physical and chemical characteristics. Feed water deaerating equipment has been supplied to operate at pressures ranging from subatmospheric to over 125 lb./sq.in. Equipment for deaerating cold water with temperatures as low as 35°F and other equipment to remove carbon dioxide, hydrogen sulphide and ammonia have been furnished in relatively small as well as in large capacities.


OXYGEN FROM DOMESTIC SERVICE WATER

ARMY E NAVY

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CARLETON CLARK NOW HEADS PULP & PAPER DIV. OF NASH ENG. CO.

The appointment of Carleton L. Clark as manager of its Pulp & Paper Division was recently announced by the Nash Engineering Company, South Norwalk, Connecticut. Mr. Clark's appointment became effective August 1. His headquarters are located in the Graybar Building, New York 17, New York.

The Pulp & Paper Division of the Nash company has been managed for a number of years by Carlo Vicario, who will now assume new and larger responsibilities with the company. He will, however, be available for consultation on all matters concerning the company's business in the pulp and paper field. Mr. Clark is well known in the industry; he has been connected with the division he now heads for more than 13 years.

◆

▸▸▸ The National Association of Personnel Directors has elected for a second term, *Thomas O. Armstrong*, as president of the association. Mr. Armstrong is manager of industrial relations at the Electric Appliance Division plant of the Westinghouse Electric and Manufacturing Company, East Springfield, Massachusetts.

◆

▸▸▸ The election of *Oliver H. Clapp* as a vice president has been announced by Stein, Hall & Company, Inc., New York City. Mr. Clapp resigned as assistant vice president in July, 1942, and joined the Defense Supplies Corporation in Washington. More recently he served as an executive of the Foreign Economic Administration.

◆

GOODRICH NAMES RES. SUPERVISOR AT KENT COLLEGE LABORATORY

A release from Dr. Howard E. Fritz, director of research, The B. F. Goodrich Company, Akron, Ohio, states that Edward A. Willson has been named resident supervisor of the synthetic rubber laboratories operated by the company at Kent State University, Kent, Ohio.

Mr. Willson entered the company's research laboratories in 1928 after his graduation as a chemical engineer from the University of Washington. Among his research assignments, from 1939 to 1941, was work at the company's laboratory established in the heart of the rubber plantation territory in Malaya, which he left before the Japanese seized the territory.

▸▸▸ With headquarters at the company's Foxboro (Mass.) office, *Paul Torre* has become associated with the staff of sales engineers of The Foxboro Company, covering the New England territory. Mr. Torre has had wide experience in technology and production control, especially in pulp and paper mills.

◆

LINK-BELT ANNOUNCES CHANGES ON PAC. COAST

Personnel changes on the Pacific Coast have been announced by Link-Belt Company.

Fred A. Koepf, until recently assistant manager at Los Angeles, has been advanced to the position of district manager for the northwest Pacific Division territory, with headquarters at Seattle.

Fred A. Koepf

G. T. Lundquist

George T. Lundquist, who has been assistant to H. V. Eastling, vice president and sales manager, San Francisco, succeeds Mr. Koepf as assistant manager at Los Angeles.

Mr. Koepf became a "charter member" of the Link-Belt Pacific Division in San Francisco, in 1923 when the company purchased Meese & Gottfried, by whom he was then employed. He was transferred to Los Angeles in 1927. Mr. Lundquist began his record of service in the "old" Link-Belt San Francisco plant in 1925.

◆

▸▸▸ The management of all Allis-Chalmers field sales offices of the General Machinery Division, and their operations, has been given over to *Frank C. Angle*, who has been manager of Allis-Chalmers sales activities in the Pacific region. He will continue to supervise operations of the Pacific region.

◆

▸▸▸ The election of *Leon H. Marsh* as vice president and sales manager been announced by The Kennedy Valve Manufacturing Company, Elmira, New York. Mr. Marsh will be in charge of all sales and public relations of the company. He has been associated with the company for more than 25 years.

A NEW PROGRAM IN FORESTRY PROMOTION HEADED BY GILLETT

A new forestry promotion program has been set up by the American Forest Products Industries, Inc., Washington, D. C. Heading this work which was effective September 1, is Charles A. Gillett, former State Forester of Arkansas and lately Industrial Forester of the Seaboard Air Line Railway.

Mr. Gillett will direct efforts seeking greater public understanding of the forest fire problem, the organization of new state "green" committees similar to those in Washington, Oregon, and Minnesota, and act as liaison officer between AFPI and state forestry departments.

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▸▸▸ *Littleton C. Barkley*, manager of the New York office of The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., has been appointed sales manager of the Mechanical Rubber Goods Sales Department.

◆

J. D. BROWN OF CAN. I. P. CO. GOES WITH SPROUT WALDRON

Resigned from his position as groundwood superintendent of the Three Rivers Division of Canadian International Paper Company, J. D. Brown has taken over the work as chief engineer of the Pulp & Paper Division for Sprout Waldron & Company, Muncy, Pennsylvania.

Mr. Brown has been an active member of the Technical Section of the Canadian Pulp & Paper Association. In 1942 he received the Weldon gold medal for the best contribution to the Technical Section for the period.

Necrology

ISAAC GILMAN

Isaac Gilman, president of the Gilman Paper Company, died Aug. 27 at his home in Gilman, Vermont. He also had maintained a New York City residence at the Beekman Hotel. He was 79 years of age.

Mr. Gilman started building a paper mill in 1911 at Fitzdale, Vt., which then consisted of four farmhouses. Three years later when part of the mill was completed and in operation, the residents of the town changed its name to Gilman. The population of Gilman now is about 2,000, and the company employs more than 3,000 people. Nearly all the townspeople work for

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Los Angeles • San Francisco • Seattle, Wenatchee and Yakima (Wash.)

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

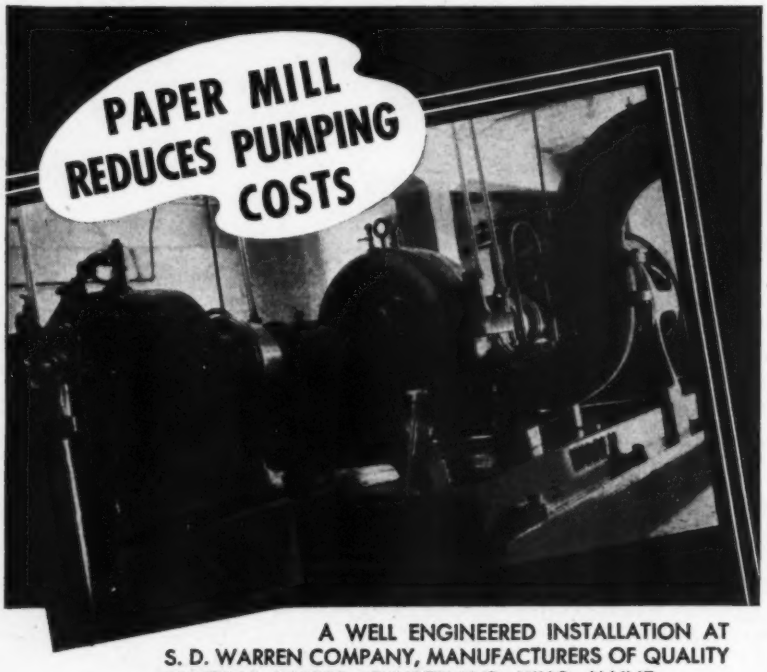
the Gilman company—the main offices of the company are at 630 Fifth Ave., New York.

The Gilman company and its affiliates, the Millett Corporation and the Kraft Bag Corporation, manufacture newsprint, kraft paper, paper bags and other paper products. Also affiliated is the Gilman Electric Light and Power Company, which supplies the power for the company and surrounding communities.

Shortly before the present war, Mr. Gilman built a woodpulp mill at Howland, Me., which became the Northern Kraft Corporation. He also built a pulp and paper mill at St. Mary's, Georgia, known as St. Mary's Kraft Corporation, and repaired the disused railroad between that town and Kingsland, Georgia, renaming it the St. Mary's Railroad Company.

Mr. Gilman also was a director of the company and was president and director of the International Folding Paper Box Company and a director of the Pennsylvania Exchange Bank. He was formerly a director of The New York Post, when that newspaper was owned by J. David Stern.

Surviving are the widow, two sons and four daughters.



A WELL ENGINEERED INSTALLATION AT S. D. WARREN COMPANY, MANUFACTURERS OF QUALITY PRINTING PAPERS, CUMBERLAND MILLS, MAINE . . . ASSISTED BY A WARREN PUMP.

Paper Mills place a premium on reliability and performance. At Cumberland Mills the plant hydraulic elevator pump has a dual drive turbine and synchronous motor.

The turbine driver is used to regulate heat balance and to supply process steam. Pump requirements are thus served with by-product power. The synchronous motor generates when the steam demand exceeds the pump load and operates as a motor when the demand is less. Pump power costs are reduced to a minimum.

In addition to building pumps for every paper mill service, Warren cooperates with plant engineers in working out money-saving installations.

WARREN PUMPS

ARMY E NAVY

WARREN STEAM PUMP COMPANY, INC.
WARREN, MASSACHUSETTS

JOSEPH H. DOW

Well known throughout the paper industry, Joseph H. Dow, of Castle & Overton, Inc., passed away August 5 in Mexico City. He was 57 years of age.

Mr. Dow had been connected with Castle & Overton for 13 years. He was in charge of the wire, felt and paper machine equipment department. Formerly he had been sales manager for Eastwood Wire Works (now Eastwood-Nealley Corporation), Belleville, New Jersey.

He is survived by his widow, Mrs. Alice Dow, secretary of the Pennsylvania-New Jersey-Delaware Division of the American Pulp and Paper Mill Superintendents Association, and a daughter, Mrs. Alice Holland.

◆

WILLIAM B. MARVIN

Connected with the company for 39 years, William B. Marvin, secretary of Farrel-Birmingham Company, Inc., Ansonia, Connecticut, passed away August 13. Mr. Marvin entered the employ of Birmingham Iron Foundry in 1905 and was treasurer of the latter firm at the time of the amalgamation of the Farrel and Birmingham companies in 1927.

Surviving are the widow, a daughter and a son, Corporal Chester F. Marvin, of the U. S. Army.

◆

▶▶▶ A director and secretary of The B. F. Goodrich Company, Akron, Ohio, *Shelby M. Jett* passed away August 9 while aboard an airplane returning from Detroit. He had been secretary of the company since 1927. He was 55 years of age.

◆

HARRY SCOTT WHERETT

Chairman of the board of directors of the Pittsburgh Plate Glass Company, Harry Scott Wherett passed away August 13. Mr. Wherett was 68 years of age. He had been associated with the organization for more than 53 years—the longest service record of any employee.

In 1891, at the age of 15, Mr. Wherett secured employment as office boy with the Diamond Plate Glass Company, which in 1895 became a part of the Pittsburgh Plate Glass Company. A year later he was transferred to the companys general office in Pittsburgh as a clerk in the sales department. He advanced successively to manager of plate glass sales, chairman of the commercial department, vice president, president, and in January of this year he became chairman of the board.

ATKINS

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AREA OF LEAK	AIR		STEAM		WATER	
Diameter Inches	Number of cubic feet per month at 75 lb. pressure	Total cost of waste per month 11c per 1000 cubic feet	Pounds wasted per month at 160 lb. pressure	Total cost of waste per month 65c per 1000 lb.	Gallons wasted per month at 60 lb. pressure	Total cost of waste per month 16c per 1000 gallons
1/2"	13,468,000	$1,481.44	1,219,280	$792.53	1,524,100	$243.86
3/8"	7,558,500	831.44	684,290	444.79	855,360	136.86
1/4"	3,366,990	370.37	304,820	198.13	381,020	60.96
1/8"	824,570	90.70	74,650	48.52	93,310	14.93
1/16"	213,000	23.43	19,280	12.53	24,110	3.80
1/32"	52,910	5.82	4,790	3.11	5,990	.96

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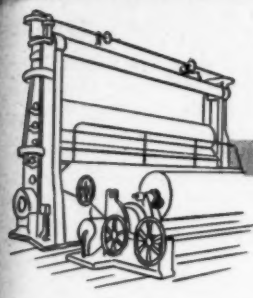
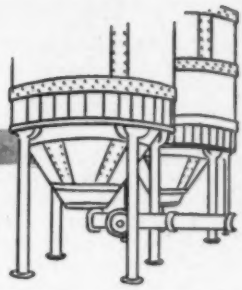


Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Some Causes of Belt Troubles

Whipping or flapping of a belt may be caused by:

An unsteady or excessive load

A pulley, eccentric or out of balance

A loose foundation or support

A sprung shaft or uneven belt

You may find the cause by:

Comparing period of flap with the cycle of machine

Bracing or steadying certain parts

Changing speed of engine

Usually the "cause" will suggest the remedy. If the cause is not evident, increasing or decreasing the belt tension may help; or an idler may be used to steady the belt without materially increasing the tension.

Excessive belt slip may be caused by:

Pulley too small giving insufficient arc of contact

Belt running under insufficient tension

Belt stiff or hard from lack of proper dressing

Belt coated with dirt, etc., often due to use of a sticky dressing

Belt may have been made from leather or other material with too low a co-efficient of friction.

A belt may run crooked because:

The ends were not properly squared before lacing, so that belt edges do not come in line

Laced tighter on one edge than the other

One edge of belt has been stretched by being forced on after being made endless, or when permitted to climb a step or flanged pulley.—*Belt Users' Book*, J. E. RHOADS & SONS.

◆

Correct Placing of Fire Extinguishers

Extinguishers of the carbon dioxide and vaporizing liquid type should be hung on hangers supplied for the purpose by the manufacturers. Other types may be hung on hangers or set on brackets or shelves.

Most extinguishers should be placed so that their tops are not more than 5 feet above the floor. These include carbon dioxide units of 10-lb. capacities or less; water under 5 gallons; foam and vaporizing liquid under 2 gallons; loaded stream, soda acid, dry compound and water and sand pails. Pails should not have their rims less than 2 feet nor more than 5 feet above the floor.

The 15 and 20-lb. carbon dioxide, 5-gal. water, 5-gal. foam and 2 and 3-gal. vaporizing liquid types should have their tops not more than 3½ feet above the floor.

The chief purpose of keeping the extinguishers low is to permit ready removal without accidental discharge or to avoid injury.—WALTER KIDDE & CO., INC.

◆

Locating and Stopping Chlorine Leaks

When the odor of chlorine indicates a leak, authorized persons equipped with gas masks should immediately investigate. All other persons should leave the affected area until the nature of the leak has been determined and the trouble corrected. *Always keep on the windward side of a leak.*

Locating a leak is best accomplished by swabbing the suspected points with a rag tied on the end of a stick and soaked in strong ammonia water. The chemical reaction between the escaping chlorine gas and the ammonia vapors results in a heavy white smoke which will reveal the point from which chlorine is issuing. A supply of strong ammonia water should always be available.

If the leak is found to be in the consumer's chlorine handling equipment, the chlorine container valve and the main unloading line valves should be closed immediately. All chlorine container valves close by turning in a clockwise direction (right hand).

If the leak is found to be in the container, steps should immediately be taken to correct it. *Delays are dangerous.* Leaks around valve stems may be stopped by tightening packing nuts. All standard chlorine valve packing nuts tighten clockwise. When the nature of the leak is such that it cannot be stopped effectively in a short period of time, the container should be moved out of doors. If it is a cylinder, stand it upright to prevent the escape of liquid chlorine. Under these conditions vaporization rapidly diminishes as natural chilling takes place and the escape of chlorine into the air is very slow. Ton containers have two valves; and in case of a leaky valve, the container should be rolled so the valves are in a vertical plane with the leaky valve upward. In this position the valve will leak chlorine gas, not liquid chlorine. In the case of a leaking tank car it should be moved to a point on the consumer's private tracks where it will do the least harm. Chlorine leaks should be approached from the windward side. *Leaking containers will not be accepted by railroads or other carriers for shipment. It is illegal to ship chlorine in containers which have been exposed to fire.* (Paragraph 303 p. 11 of ICC Regulations effective January 7, 1941.)

Water played on a gas leak will not stop the leak. Water played on a leaking tank car always makes the leak worse; it will never diminish it.

All leaks may be lessened by lowering the pressure in the container. This is best accomplished by rapidly withdrawing chlorine gas from the container. If the consumer's regular process will not take gas rapidly enough to give the desired effect, arrangements can easily be made to introduce the gas into a milk of lime suspension or a caustic soda solution made up in a barrel or other suitable container. Use 10 lb. of hydrated lime or 25 lb. of caustic soda to each 10 gallons of tap water. 1.25 lb. of hydrated lime or caustic soda will be needed for each pound of chlorine absorbed. Rubber hose or iron pipe can be used for this emergency work—*Chlorine* (6th Edition), THE PENNSYLVANIA SALT MANUFACTURING COMPANY.

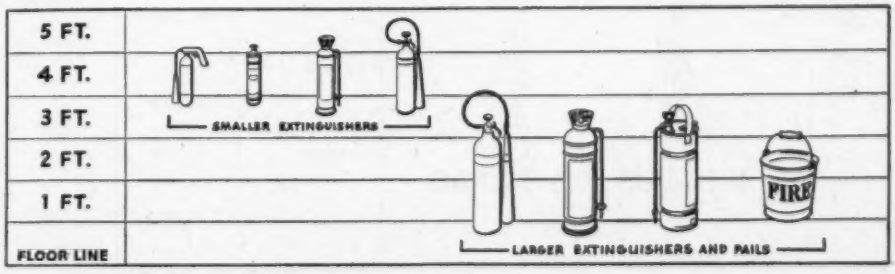
◆

A Handy Block and Tackle Chart

Here is a chart that will be found useful for determining safe loads and proper loads in connection with ordinary block and tackle. (*Chart on following page.*)

By laying a straight edge across the chart, as indicated by the dotted line, the pull necessary to lift any weight up to 20,000 pounds is immediately given in column B.

This chart, takes into account the friction of the ropes and pulleys, which is less for a smaller number of ropes although the



pull on the lead line is decreased if a larger number of ropes are employed.

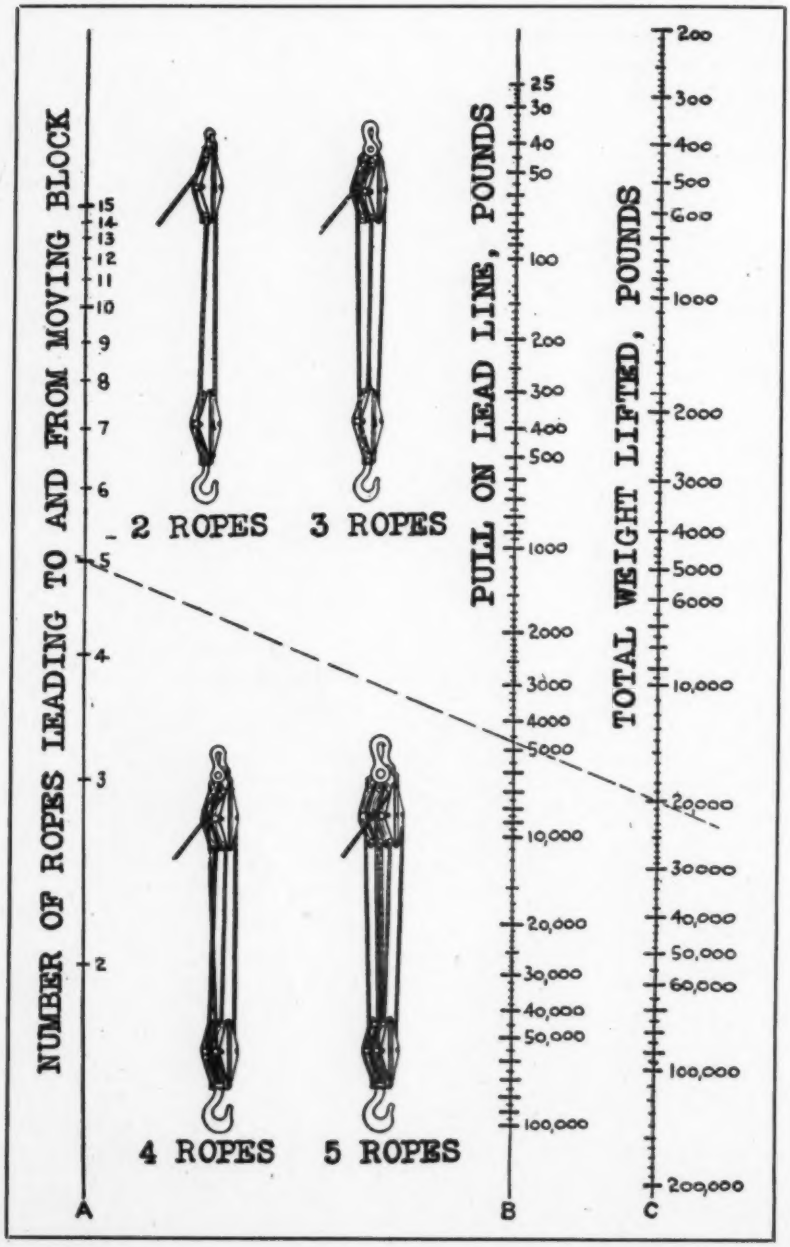
For example, what pull on the lead is required to lift 20,000 pounds with five ropes?

Solution: The graduation corresponding to 5 in column A is connected by a straight line with that corresponding to 20,000 pounds in column C. The straight line intersects column BB approximately 4700, which is the pull required.

The number of ropes supporting the load and used in column A is determined by counting the ropes leading to and from the moving block as illustrated by the sketches.

In arriving at the stress in the lead line, the common practice is to divide the weight of the load by the number of ropes supporting it, but this is not correct as it does not take into account the friction of the blocks or the rigidity and internal friction of the rope. The maximum stress when hoisting occurs in the lead line, since this besides taking a proportion of load on a single supporting rope also takes the accumulated friction of the blocks and rope in all the other parts of the tackle.

If, for example, a "seven rope" hoist is employed for raising a load of 35,000 pounds, according to the usual practice the stress in the lead line would be computed as 5,000 pounds, assuming that all parts pulled equally. This stress occurs, however, only in the becket line. The maximum stress is 6325 pounds as determined by test. The chart gives that figure very closely, as will be observed.



Although this chart is based on figures that were determined for wire rope tackle, it is also applicable to ordinary manila rope.

It must be remembered, when buying a rope for use in a block and tackle, that the rope must be strong enough to resist the "maximum" pull, which is the pull in the lead line.—W. F. SCHAPHORST.

◆

Loading Paper in Railroad Cars or Motor Trucks

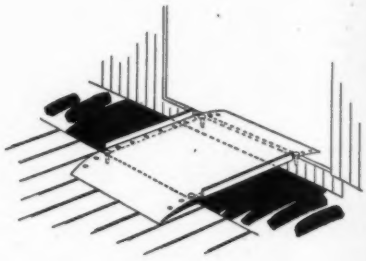
1. Before using loading plates as runways, make sure they cannot shift.

2. Block all floor rolls before starting second tier.

3. Before entering trailer, make sure front supporting gear is in correct position and tractor completely detached.

4. Use only substantial knot-free planks for bridging between electric lift trucks and other levels, or as runways from car floor to top of first tier. Always brace and block such planks to prevent them from slipping or falling.

5. When tightening steel tapes around rolls, wear your goggles and stand to one side to keep from being slashed should the tape break.



6. Stay in empty end of car while electric truck is moving in; if neither end is empty, stand in other doorway until truck backs out.

7. Do not use makeshift platforms when double decking with hoist and apron roll.

8. When pushing loaded skid into car with hand lift truck, raise truck platform to full height.

9. Do not use truck tail gates as runways or ramps for industrial trucks; remove the tail gates or drop them into the vertical position.—*Safety Instruction Card No. 527,* NATIONAL SAFETY COUNCIL.

◆

Laying Up Boilers

When boilers are taken out of service for any length of time corrosion may occur on the internal surfaces of the boilers unless certain precautions are observed. During periods of idleness, boilers may be laid up by one of the two methods described below. The choice of method is dependent on how long the boiler is to be out of service, and how quickly the boiler may be required back in service for regular steaming purposes in an emergency, etc.

The Dry Method

The dry method is preferable when a boiler is to be out of service for a month

or more and will not be required for emergency purposes. The boiler should be drained, thoroughly cleaned and carefully inspected to insure all is in good order. The boiler should then be thoroughly dried internally by means of hot air stoves or a light wood fire. An amount of quick lime, approximately 30 pounds for each 100 boiler horsepower should be spread on watertight, wood trays placed in the boiler immediately after the drying-out process. If the boiler is HRT or locomotive type, a single tray resting on top of the flues or in the bottom of the shell will be adequate. In a multi-drum water tube boiler, a tray should be placed in each drum. The manheads, handholes and all connections on the boiler should be lightly blanked or closed after the lime has been placed in position. If the boiler is idle for a considerable period, it should be opened every three or four months for examination and renewal of the quick lime if necessary.

The Wet Method

The wet method should be employed if boilers must be left idle for a period longer than a week with water in them, so as to constitute emergency service if required. The boiler should be thoroughly cleaned and carefully inspected to insure all is in good order. After the boiler is filled to the normal water level the water should be boiled with the boiler properly vented to atmosphere for a short period. This procedure is necessary to expel the dissolved gases released from the water by boiling. The water should then be made alkaline in excess of 400 ppm by the use of caustic soda (*approximately* 3 pounds of caustic soda per 1000 gallons of water in the boiler). In addition, sufficient sodium sulphite should be added to the boiler water to produce a minimum residual sulfite content of 100 ppm (*approximately* 1.5 pounds of sodium sulfite per 1000 gallons of water in the boiler). After the boiler is cooled somewhat, but before a vacuum is created, the boiler should be filled completely and all connections closed. Periodically, at approximately weekly intervals tests of the water should be made and the alkalinity and sulfite concentrations increased if necessary to maintain the recommended concentrations. It is advisable to keep the water in the boiler as cold as possible. Corrosion is promoted by lukewarm water. For this reason, feed valves and all steam connections should be tight at all times.

If it is necessary for such an idle boiler to be returned to service, the boiler should be blown down well before placing on line in order to reduce boiler water alkalinity and prevent carryover.—W. H. AND L. D. BETZ.

◆

Calculator Determines Line Current

Plant engineers and electricians will find this Line Current Calculator useful for quickly determining amperes that will flow in motor and transformer circuits.

The single phase unit solves the equaton:

$$I = \frac{H_p \times 746}{E \times PF \times Eff} \quad \text{(for motor current)}$$

$$I = \frac{\text{kv.-a.} \times 1000}{E} \quad \text{(for transformer current)}$$

Where E = voltage between line wires
PF = power factor
Eff = efficiency—87.5% assumed

Three phase equations solved by the three phase unit are the same as above except that the denominator of the fraction includes 3.

Suppose a 5 hp., single phase, 220 volt motor is to be installed. Set the dial accordingly—assuming 80 per cent power factor, opposite 80 read approximately 24 amps. Now suppose a 15 kv.-a., three-phase 440 volt transformer is to be installed. Set the dial properly—opposite kv.-a. amps read approximately 20 amps. With the line current thus determined, proper wire size can be selected to carry the load.

Several voltages that are seldom used around plants are included for the convenience of those who might have occasion to utilize them.

To Assemble the Calculators

Cut along the inner and outer circles to make two rings and two discs. Mount these pieces on separate pieces of cardboard using rubber cement. Punch the center holes carefully. Insert brass bolts (with washers) to hold the parts together. Add nuts to the bolts and tighten—the discs should turn easily yet hold their setting. A drop of solder on the nuts makes the assemblies permanent.—V. W. PALEN *(formerly with Westinghouse Electric and Manufacturing Company.)*

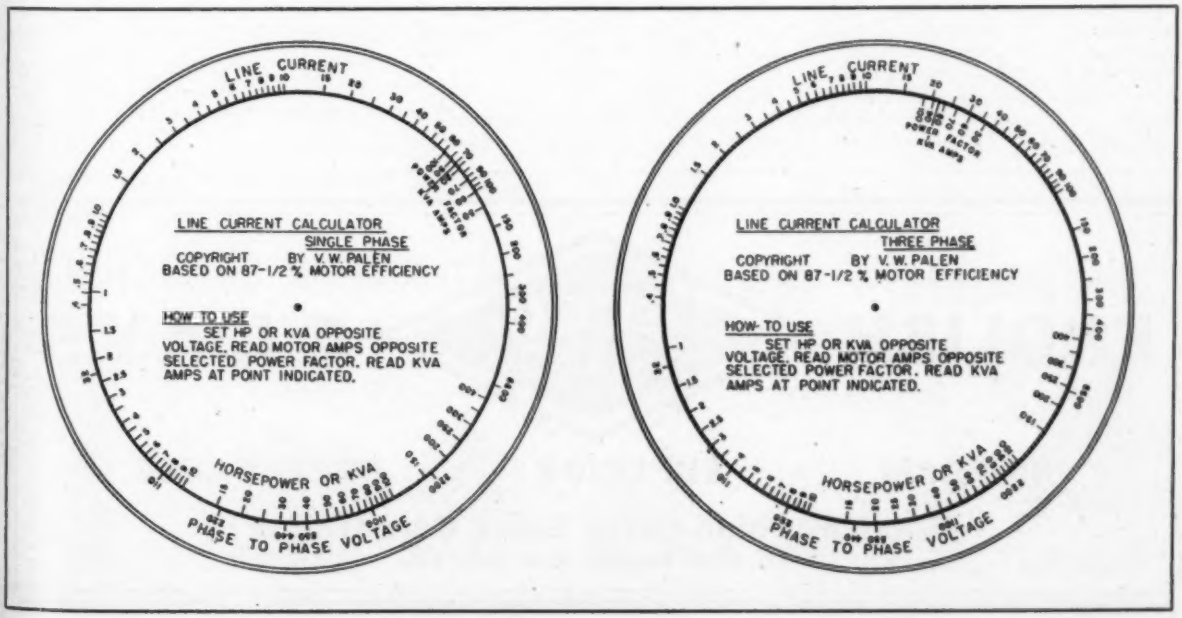
◆

An Identification for Piping Systems

Many mills find it advantageous to identify their intricate piping systems. Usually, the body of the pipe is painted the same as the adjacent surface; and valves, elbows, and pipe, where passing through a wall, etc., are given an identifying color. Each mill has its own system of identification. However, some suggestions may be obtained from the following outline (a different shade of the same general color being advised under each classification):

Sprinkler	Red
Compressed Air	Yellow
Electric Conduit	Black
Sewer Pipe	Green
Steam	Aluminum
Return Steam	Buff
Hot Water	Gray
Cold Water	Blue
Oil	Brown

—R. C. SHEELER, THE PAPER INDUSTRY AND PAPER WORLD.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LINE CURRENT CALCULATOR
SINGLE PHASE
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BASED ON 87-1/2 % MOTOR EFFICIENCY
HOW TO USE
SET HP OR KVA OPPOSITE VOLTAGE, READ MOTOR AMPS OPPOSITE SELECTED POWER FACTOR. READ KVA AMPS AT POINT INDICATED.
HORSEPOWER OR KVA
PHASE TO PHASE VOLTAGE
LINE CURRENT
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SET HP OR KVA OPPOSITE VOLTAGE, READ MOTOR AMPS OPPOSITE SELECTED POWER FACTOR. READ KVA AMPS AT POINT INDICATED.
HORSEPOWER OR KVA
PHASE TO PHASE VOLTAGE

Weatherproof Solid Fiberboard[1]

An Evaluation of the Quality of Commercial Boards and the Development of an Improved Weatherproof Board

F. A. SIMMONDS, Chemist
J. N. McGOVERN, Technologist
C. O. SEBORG, Associate Chemist

SUMMARY

Commercial weatherproof solid fiberboards of the V-type were evaluated particularly for rigidity (bending modulus) and resistance to failure at the score (Carlson score-strength number), before and after immersion in water for 48 hours, and for water absorption. The V-boards, after immersion, had values for bending modulus and score-strength number that were 25 to 30 per cent of the dry values. V1S boards showed score-strength numbers twice those for V3S boards, but had the same bending modulus.

The best experimental boards, made from either commercial jack pine or southern yellow pine kraft pulps, were, when wet, twice as rigid, three times as strong in score strength, and, at equilibrium, absorbed from 25 to 51 per cent less water than did the commercial boards having the best values for these properties. Furthermore, all of these improved properties were obtained in individual boards, whereas the respective best values used for comparison were each found in different commercial boards. The improvements were the result of employing a wet-strengthening treatment, the use of a greater number of individual plies having higher dry strength than those used in the commercial boards, and the consequent increase in the amount of water-resistant adhesive used in laminating the solid fiberboard.

INTRODUCTION

The weatherproof solid fiber container manufactured today for use in overseas shipment, the so-called "Victory Container," is deservedly regarded as being far superior to prewar containers in serviceability and in resistance to failure when wet. Further improvements in the strength and rigidity of fiber containers are, nevertheless, highly desirable to afford greater protection to the contents. An investigation of some of the factors influencing the strength and rigidity of solid fiberboard to be used in such containers, now in progress at the Forest Products Laboratory, is particularly concerned with the properties of the board in the water-soaked condition. It is the purpose of the present report to summarize the results thus far obtained.

TEST METHODS

The following tests were made on small specimens cut from sample panels of both commercial and laboratory boards:

(a) The thickness and weight per 1,000 square feet of the boards were determined on air-dry specimens after conditioning to equilibrium at 50 per cent relative humidity and 75 Fahr.

(b) The stiffness or rigidity of flat panels expressed as the modulus of elasticity in bending was determined by the Tinius Olsen stiffness tester[2], using a specimen 2 inches wide on a 2-inch span.

(c) The resistance of the scored or creased portion to failure in combined tension and bending, expressed as a "score strength number," was determined by the Carlson score tester.[3] The boards were scored or creased with a 3/16 by ½-inch bar scorer. Test strips 1 inch wide were cut with the score perpendicular to the length of the specimen.

(d) The tensile strength of a board was determined perpendicular to the score on a strip 0.6 inch wide.

(e) Water absorption was determined on a 6- by 10-inch board after immersion in water for 24 hours (U. S. Army Specification No. 100-14A). The water absorption value was based on the air-dry weight of the board conditioned as described in (a). Water absorption approaching that at equilibrium was determined after 48-hour immersion of specimens 2 inches wide and 4 inches long, based on the air-dry weight of the specimen conditioned as described.

(f) The bursting strength of the boards was determined according to U. S. Army Specification No. 100-14A.

The bending modulus, score-strength number, and tensile-strength determinations were made on air-dry specimens conditioned as described and on specimens after immersion in water for 48 hours. This immersion time was adopted to avoid incompletely soaked specimens in evaluating the influence of the wet-strengthening resin used in the experimental boards. Water absorption rate determinations show the 48-hour period to be practically equivalent to equilibrium conditions. The test values reported are the averages of determinations in and across the machine direction of the boards.

Tests on Commercial Boards

Table 1 shows minimum requirements for solid fiberboard according to Army Specification No. 100-14A.

Table 1.—*Minimum requirements for solid fiberboard.* (U. S. Army Specification No. 100-14A)

Grade	Symbol	Minimum caliper	Minimum average bursting strength	
			Dry	After 24-hour immersion
		Inch	Lb. per sq. in.	Lb. per sq. in.
1	V1S	0.100	750	500
3	V3S	.090	400	150

A commercial 100-point, nonweatherproof, solid fiberboard was tested for comparison with commercial weatherproof boards. The nonweatherproof board had fairly high values for bending modulus, score-strength number, tensile strength, and bursting strength when the board was dry, but it became weak after immersion in water (No. 1, table 2). The soaked board was completely delaminated and absorbed water in the standard 24-hour test to the extent of 180 per cent of its air-dry weight and to the extent of 190 per cent on the same basis when samples 2 by 4 inches in size were immersed for 48 hours. The

(1) One of a series of progress reports prepared by the Forest Products Laboratory (Madison, Wisconsin) to further the Nation's war effort. Results here reported are preliminary and may be revised as additional data become available.
(2) Tinius Olsen Testing Machine Company, Philadelphia, Pa.
(3) U. S. Patent 1,612,415. "Fibreboard Score Test."

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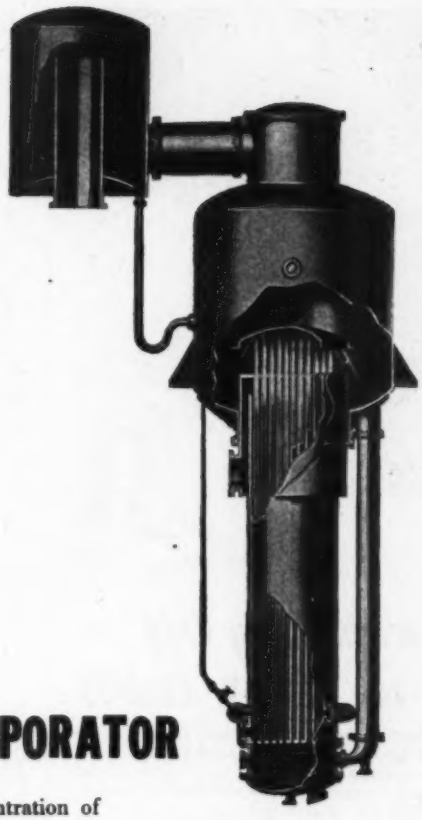

*CONKEY LONG TUBE FILM TYPE EVAPORATOR

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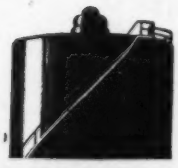
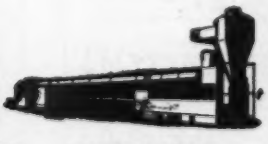


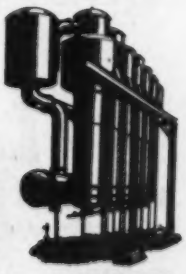
TURBO-MIXERS, AGITATORS, AERATORS

CONKEY VACUUM AND PRESSURE FILTERS

AMERICAN DRUM DRYERS AND FLAKERS



LOUISVILLE DRYERS, COOLERS, KILNS



CONKEY VACUUM EVAPORATORS

Table 2.—Composition and properties of weatherproof 100-point caliper solid fibreboards and the component plies.

Description of board	Machine run	Individual ply: Rosin	Individual ply: Wax	Individual ply: Media mine	Individual ply: Thickness	Individual ply: Weight	Individual ply: Density	Individual ply: Size No.	Individual ply: Average tensile strength Dry	Individual ply: Average tensile strength Wet	Laminating adhesive: Amount of urea formaldehyde based on starch	Laminating adhesive: No. of plies	100-point board: Thickness	100-point board: Weight	100-point board: Bending modulus Dry	100-point board: Bending modulus Wet[1]	100-point board: Score strength Dry	100-point board: Score strength Wet[1]	100-point board: Aver. tensile strength of scored strip Dry	100-point board: Aver. tensile strength of scored strip Wet[1]	100-point board: Water absorption 24[2] hours	100-point board: Water absorption 48[2] hours	100-point board: Bursting strength Dry	100-point board: Bursting strength Wet[2]	Test No.
	No.	Percent on pulp			Mils	Lb. per 1,000 sq. ft.	Gm. per cc.		Lb. per sq. in.		Percent		Mils	Lb. per 1,000 sq. ft.	Lb. per sq. in.		Carlson number		Lb. per sq. in.		Percent		Lb. per sq. in.		
Commercial Nonweatherproof																									
1. 100-point caliper																									
2. 25-point caliper, southern yellow pine kraft		0.7	0	0	25.0	86		0.9	7,335	782				351	235.0	0.0	37	6	2,322	116	181	189	450	40	
Weatherproof																									
3. 25-point caliper jute filler		3.5	0	0	25.0	103	0.82		4,473	832															
4. 100-point caliper, V38. Average of 4 boards																									
5. 100-point caliper, V18. Average of 8 boards																									
6. 100-point caliper. Best values of 13 boards, V18, V28, and V38																									
Experimental Nonweatherproof																									
7. Commercially made southern yellow pine kraft cylinder board		.7	0	0	8.1	37	.87	4.3	7,875	1,005	20	12	105	529	460.5	137.0	130	52	7,900	1,323		44			33
Do.		.7	0	0	9.3	40	.83	2.9	8,540	915	20	10	100	470	420.0	113.0	115	53	6,908	1,741		45			34
Do.		.7	0	0	11.6	48	.79	1.9	9,375	976	20	9	108	501	396.0	99.0	135	53	8,508	1,324		51			35
Do.		.7	0	0	13.2	55	.80	1.9	8,790	1,113	20	7	93		482.5	99.0	140	34	7,490	1,375		55			36
Do.		.7	0	0	14.5	57	.76	1.6	7,619	781	20	7	98		418.5	109.5	134	32	7,050	1,293		61			37
Do.		.7	0	0	19.6	73	.72	1.3	7,435	788	20	5	95	398	449.0	86.0	130	50	5,888	825		73			38
Do.		.7	0	0	25.2	86	.65	1.0	7,335	782	20	4	99	385	388.0	86.0	114	24	6,410	738		70			39
Do.		.7	0	0	22.5	88	.75	1.3	6,995	735	20	3	90	371	388.0	109.0	123	27	5,295	682		61			40
Do.		.3	0	0	17.4	52	.58	.8	6,534	581	20	6	95	370	425.5	92.0	135	50	6,623	894		72			41
Weatherproof																									42
17. Experimental Fourdrinier board: commercial jack pine kraft pulp	2,091	3.0	1	4	8.0	33	.72	4.4	8,895	3,352	20	12	94	478	505.0	141.5	99	131	9,290	3,225	31	43	1,000+	1,000+	14
18. Do.	2,093	3.0	1	4	15.0	64	.81	3.8	4,788	1,720	20	7	105	511	386.0	108.0	79	79	3,961	1,878		78	1,000+	990+	16
19. Do.	2,092	3.0	1	4	18.0	63	.68	2.5	4,330	1,372	20	6	105	431	310.0	72.5	70	58	3,705	1,130		65	836	990+	15
20. Do.[3]	2,091	3.0	1	4	8.9	33	.72	4.4	8,895	3,352	20	11													
Experimental Fourdrinier paper: commercial southern yellow pine kraft	2,173	3.0	1	4	3.7	15	.70	4.5	6,754	2,723	(?)	2	98	523	426.5	114.5	133	147	8,710	4,290	10	28	1,000+	.....	54
21. Experimental Fourdrinier board: experimental loblolly pine kraft pulp	1,997	2.0	2	2	13.0	50	.74	1.4	5,448	2,387	5	6	98	430	264.0	71.5	106	59	.....	1,402	32	34	850	990+	6
22. Do.	1,997	2.0	2	2	13.0	50	.74	1.4	5,448	2,387	25	6	95	449	261.0	129.0	...	80	.....	.....	...	53	.....	.....	5
23. Do.	2,113	3.0	1	4	8.7	32	.71	3.9	5,086	1,727	20	10	95	509	518.0	109.0	65	75	5,240	2,182	41	46	1,000+	990+	17
24. Do.: commercial southern yellow pine kraft pulp	2,225	0.0	0	4	8.0		.69	3.9	7,565	1,777													1,000+	990+	
25. Do.	2,223	3.0	0	1	8.0	36	.83	5.4	6,120	875	25	12	93	504	373.0	79.0	118	69	7,520	2,330	32	42	1,000+	990+	28
26. Do.	2,174	3.0	1	4	10.0	38	.75	7.2	5,843	2,220															
27. Do.	2,174	3.0	1	4	7.0	32	.75	6.5	6,910	2,568	20	13	95	494	364.0	134.5	127	125	8,280	3,000+	18	42	1,000+	990+	27
28. Do.	2,231	2.0	0	4	8.8	39	.80	3.4	7,870	2,900	20	11	101	547	434.0	121.0	122	112	8,765	3,000+	33	51	1,000+	990+	29
29. Experimental wet machine board: commercial south. yellow pine kraft pulp		3.0	1	4	23.0	122	.84	2.5+	7,763	3,270	20	4	93	405	280.0	107.0	139	102	5,705	1,959	45	65	1,000+	990+	31
30. Do.		3.0	1	4	28.0	140	.86	2.5+	8,560	3,265	20	2													
					34.0	161	.85	2.5+	7,900	3,380	20	1[3]	90	424	362.0	.....	.....	67	7,330	2,700	43	55	1,000+	990+	32

[1]48-hour immersion of test specimen. [2]24-hour immersion of 6- by 10-inch panel. [3]2- by 4-inch specimen. [4]Except the value for weight because it is a maximum [5]Minimum values. [6]From same chest furnish used for machine run 2093. [7]Faces laminated with asphalt

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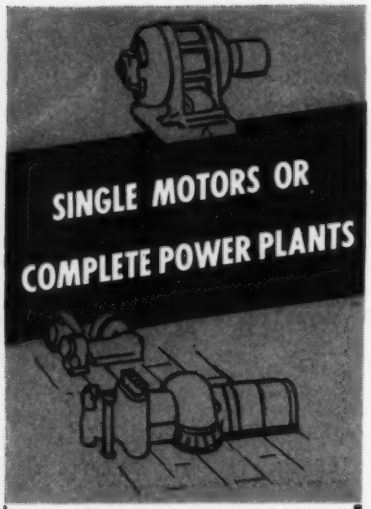

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soaked board had no measurable rigidity and had a Carlson score-strength number of 16 per cent and a tensile strength of only 5 per cent of the respective original values. The bursting strength of the soaked board after the standard 24-hour immersion was only 9 per cent of the original value.

Four samples of V3S type weatherproof board had strength qualities in the dry condition only slightly superior to those for the nonweatherproof board. Their average values are given as No. 4, Table 2. After immersion in water, however, the weatherproofed boards lost less of their dry qualities than the nonweatherproofed. They showed no delamination, retained 30 per cent of their original rigidity, had score strength numbers 36 per cent of the air-dry values, and held 15 per cent of their tensile strength while absorbing water to a value of 70 per cent after 48-hour immersion. The bursting strength after 24-hour immersion was 65 per cent of the air-dry value, while the standard water absorption test gave a value of 47 per cent.

Eight samples of V1S type weatherproof board, whose average properties are listed as No. 5, Table 2, had fairly similar strength qualities among themselves in the air-dry condition. Although their rigidity was the same as that of the V3S boards and the nonweatherproof board described previously, they had roughly a 90 per cent higher score-strength number, a 25 per cent higher tensile strength, and an 80 per cent higher bursting strength. The V1S test specimens on immersion in water for 48 hours showed no delamination, but absorbed water to the extent of 78 per cent and were only approximately 25 per cent as rigid, had 38 per cent the score-strength number, and were 15 to 20 per cent as strong in tension as the air-dry boards. After a 24 hour water immersion the V1S boards retained 85 per cent of their air-dry bursting strength and absorbed 28 per cent water in the standard test. In the wet condition the average values for the V1S boards exceeded those for the V3S boards in strength number by more than 90 per cent and in bursting strength, by 130 per cent, but was weaker in rigidity.

The best values for score strength, rigidity, tensile strength, and water absorption among the properties of the eight V1S boards are listed as No. 6, Table 2. The term best means maximum for strength properties and minimum for water absorption in the commercial boards tested thus far at the Laboratory. No one board, of course, possessed all the best qualities.

Several of the commercial boards had asphalt incorporated in their structure. Under conditions such that the amount of water absorbed was influenced more by the surface of the boards than by the edges (large panels, or small test specimens with paraffined edges) this construction showed a lower water absorption and less loss in stiffness after 24-hour immersion than the boards not so made. After continued exposure to water, however, the asphalt-containing boards also showed high water absorption and low stiffness values.

Several of the boards tested after one cycle of water immersion and reconditioning at 50 per cent relative humidity showed

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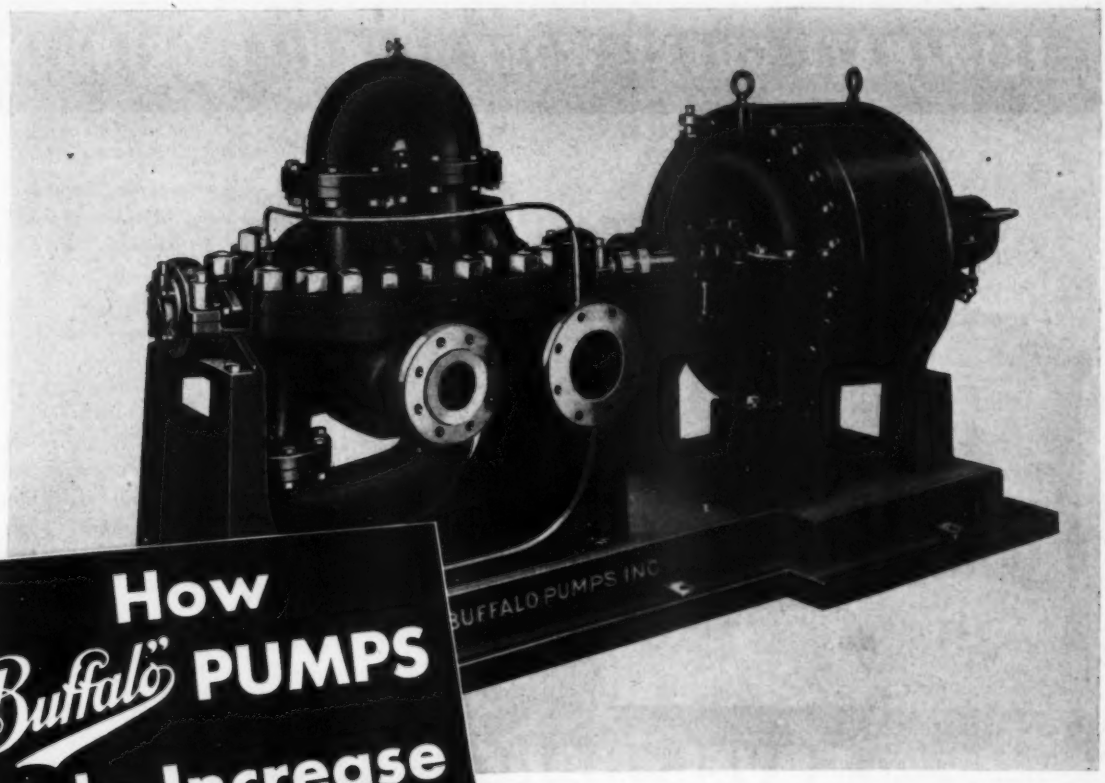

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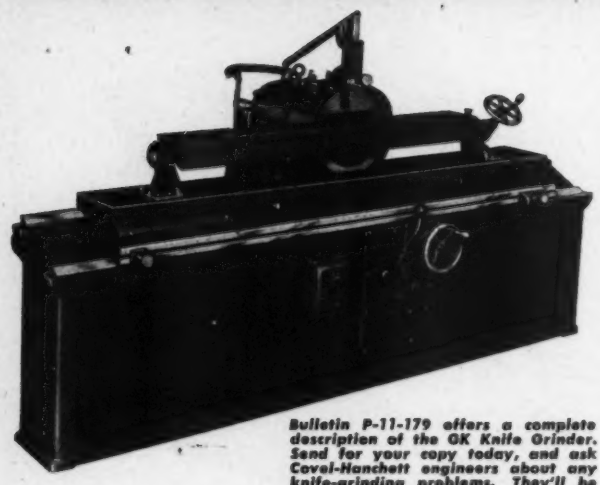

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essentially the same strength qualities as the original dry board. One board tended to delaminate on drying after immersion, possibly because the laminating adhesive contained too low a percentage of urea-formaldehyde resin.

Several weatherproof containers, made from V1S boards and immersed in salt water for 24 hours, suffered, in drum tests, a general loss of 60 to 80 per cent in resistance to rough handling. This loss is of the same order as that shown by these boards when tested for resistance to score failure after a 48-hour immersion. Since the drum tests on the containers submitted by various manufacturers were not conducted under comparable conditions, an evaluation of this quality of the different containers is not available.

EXPERIMENTAL WEATHERPROOF SOLID FIBERBOARD

With the objective of making a weatherproof solid fiberboard of improved rigidity and score strength when wet, Fourdrinier and cylinder (wet machine) boards for laminating were made from wet-strengthened furnishes of commercial jack pine and southern yellow pine kraft pulps and from loblolly pine kraft pulp prepared at the Forest Products Laboratory. Melamine resin was used as the wet-strengthening agent. For most of the laminating a urea-formaldehyde-starch adhesive was used since commercial operation has already established its suitability for this purpose. Urea-formaldehyde resin in a condition suitable for beater addition is also being tried in current work on wet strengthening fiber board in the present study.

Best Experimental Boards

The experimental weatherproof boards of approximately 100-point caliper that showed the greatest improvement in wet strength properties as compared with the commercial product were made with 12 or 13 plies. About the same degree of improvement was obtained from either commercial jack pine or commercial southern yellow pine kraft pulp. These pulps were beaten to Schopper-Riegler freeness values ranging from 750 cc. to 815 cc. and treated with 4 per cent by weight of melamine resin, 3 per cent rosin size, 1 per cent wax size, and alum to *p*H 5 added to the stuff in the beater. The stock going on the machine was not jordaned and the *p*H of the tray water was controlled with sulfuric acid.

Certain strength properties of the single ply 8- to 9-point boards and 4-point paper made as described and the 100-point solid fiberboards laminated from them are given in table 2 and identified as boards 17, 20, and 27. The tensile strength of the plies in the dry condition before lamination was relatively high, ranging between 6,900 and 8,900 pounds per square inch and comparable to some commercial boards made from southern pine kraft as illustrated by boards 7 to 16 inclusive in Table 2.

The wet tensile strength of the experimental 8- to 9-point boards and 4-point paper ranged from 2568 to 3352 pounds per square inch. A commercial weatherproof 9-point board was not available for comparison with the experimental 9-point board, but an 8-point nonweatherproof board (without wet-strength treatment), had a wet tensile strength of 1,000 pounds per square inch (board 7, Table 2). The experimental boards were considerably higher in wet tensile strength than a commercial 25-point jute filler claimed to have weatherproof qualities (board 3). This jute filler was but little higher in wet tensile strength than another 25-point commercial board (No. 2) not purported to be weatherproofed.

Experimental jack pine board.—As previously mentioned, the best values found among the commercial 100-point V-boards are shown as item 6 in table 2. No one of these boards had all of these best values. A comparison of the wet-strength and water-resistant properties of the 100-point board laminated from the experimental jack pine 9-point board (No. 17, Table 2) with corresponding best values of several commercial boards (No. 6) shows that the experimental board was almost four times as strong in tension across the score, twice as rigid, and three times as strong in score strength and, at equilibrium, absorbed 25 per cent less water. The experimental board, like the commercial board with which it was compared in regard to water resistance, had asphalt as the laminating adhesive for the top and bottom faces.

Experimental southern yellow pine board.—Experimental 100-point board 27, laminated from 13 plies of southern yellow pine kraft 7-point board was somewhat better than board 17 in rigidity, both wet and dry,

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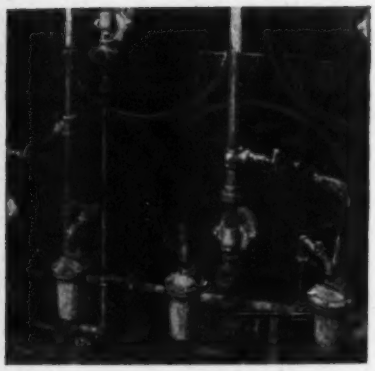

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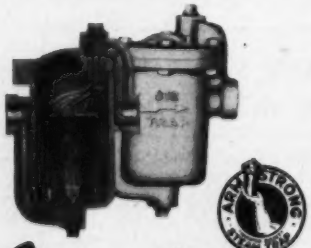

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and also in dry score strength. The dry and wet score strengths of board 27 were essentially the same. The amounts of size in each of these two boards was the same. Likewise there was no difference in the quantity of melamine resin.

FACTORS INFLUENCING PROPERTIES OF EXPERIMENTAL BOARDS

Asphalt for Reducing Water Absorption

The influence of asphalt in reducing water absorption, when used as the laminating adhesive for the top and bottom faces, is shown by experimental 100-point boards 17 and 20. Board 20 was made with one less 8-point ply than board 17 and the top and bottom faces were of approximately 4-point paper. The water absorption of board 20 at equilibrium was thereby reduced 35 per cent from that of board. 17. The wet strength properties of this board, compared with board 17 were: 33 per cent higher tensile across the score, 19 per cent lower rigidity, and 12 per cent higher score strength.

Influence of Tensile Strength of Wet Plies

The wet score strength of laminated boards tends to increase with increase in the wet tensile strength of the individual plies, as is illustrated by boards 25, 19, 18, 23, 22, 28, 27, and 17 listed in ascending order of wet tensile strength of the plies.

Influence of Absorbed Water

In the data on the experimental boards, a trend is indicated that wet rigidity is dependent on the amount of water absorbed. Wet score strength, however, does not appear to be so related.

Influence of Resin in Laminating Adhesive

An indication of the influence of the amount of resin in the urea-formaldehyde-starch laminating adhesive is shown by the results for 2 six-ply 100-point boards, Nos. 21 and 22, made from loblolly pine sulfate pulp prepared at the Forest Products Laboratory. The amount of resin based on the weight of starch used for laminating boards 21 and 22 was 5 and 25 per cent, respectively. After immersion, the water absorption of the two laminated boards was the same but the rigidity of board 22 was 80 per cent higher and its score strength was 35 per cent higher than board 21. It is thus indicated that, (1) when the resin content is sufficient to prevent delamination upon soaking, the water absorption of the board is independent of the resin content throughout and somewhat beyond the range now being used commercially, (2) the wet rigidity and score strengths are influenced by the resin content of the adhesive.

Influence of Rosin Size and Melamine

The influence of size alone and of size plus melamine resin on the wet tensile strength is indicated by the results for the 7- to 10-point boards 24 to 27 inclusive. The addition of 3 per cent rosin and 1 per cent wax size increased the wet tensile strength from the 133 pounds per square inch of the waterleaf board No. 24 to 875 pounds per square inch for board 25. The value for board 25 is essentially the same as that of board 2, the commercial jute filler in which 3.5 per cent rosin but no wax size

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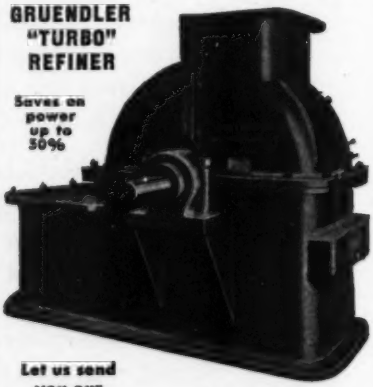

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With the lifting of war-time restrictions Roberts Grinders will be available to help you cut your grinder room labor costs. But that is only one of the many advantages of this new equipment. It is a faster and more profitable way to grind pulp for paper or board. Write for full information. We will gladly give you all of the facts on construction, installation, operation and production of this continuous, high-speed grinder.

LABOR SAVING is an important feature of the Roberts Grinder. Savings from 50% to 70% are realized by replacing pocket grinders with this new continuous, high-speed grinder. Here is what happened in one mill. The grinder room crew for 31 pocket grinders was 82 men on three shifts, including superintendent and maintenance men. 11 Roberts Grinders were installed reducing labor requirements to 30 men, including supervision and maintenance. Some four-hundred man-hours saved every working day yet daily tonnage was increased. With a definite saving such as this it is easy to see why the Roberts Grinder reduces the cost per ton to manufacture groundwood pulp.

EASE OF LOADING is one of the main reasons for large labor savings with this new equipment. With a wood conveying system one man can easily feed two grinders producing up to 100 ton of pulp in twenty-four hours. Feeding of the wood to the stone is continuous. The operating principle and new operating features eliminate interruptions in the production and flow of stock. Roberts Grinders require less maintenance and attention than any other type of grinder in use at the present time.

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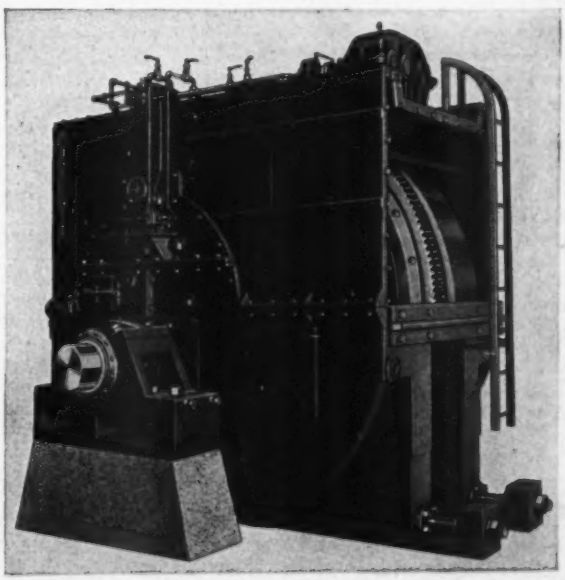

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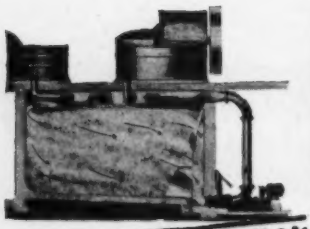

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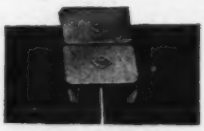

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was used. When 4 per cent melamine resin was used in conjunction with the rosin and wax size, as in boards 26 and 27, the wet tensile strength was increased to an average value of 2,400 pounds per square inch. After soaking 48 hours in tap water at approximately 75 Fahr., the per cent retention of dry tensile strength with the use of 2 to 4 per cent melamine resin, in conjunction with hard sizing, has ranged from 32 to 44 per cent. However, a comparison of the wet tensile strength of the individual plies of boards 22 and 27 with the properties of the corresponding 100-point boards indicates that perhaps as little as 2 per cent of wet-strength resin may be satisfactory and possibly less if asphalt is used as the laminating adhesive for the top and bottom faces.

Effect of Ply Thickness

Fourdrinier boards.—Most of the boards, ranging in thickness from 8 to 18 points, were made on the laboratory fourdrinier machine. As the thickness of the fourdrinier boards made from a given furnish was increased above 9 points, the strength of the boards decreased progressively and seriously. Two thicker jack pine kraft boards, of 15- and 18-point caliper, boards 18 and 19 respectively, made from the supply furnish used for the 9-point board No. 17, were much lower in dry tensile strength and in size number than board 17. These decreases are attributed to a markedly poorer formation which is unavoidable when making a heavy board on a fourdrinier machine. Apparently as a consequence of poor formation, the properties of the 100-point boards laminated from these boards were lowered considerably although when wet the tensile and score strengths were still higher than the corresponding maximum values of the commercial boards.

The decrease in the strength of the experimental fourdrinier boards with increasing thickness made it impossible to determine the effect of ply thickness with the high wet-strength material. A series of commercial boards, however, ranging in thickness from 8 to 30 points and of high dry-strength but neither hard-sized nor treated for wet strength were laminated into solid fiberboards to determine whether some indications of the influence of ply thickness would be apparent despite the nonweatherproof character of the boards. The results for this series, boards 7 to 16 inclusive, show a trend toward lower water absorption and higher tensile strength across the score when wet, for 7 or more plies. The maximum number of plies used was 12. The highest rigidity when wet resulted with the greatest number of plies but no trend in wet score strength was apparent. These trends probably result from the greater amount of water-resistant laminating adhesive present in the boards with the greater number of plies.

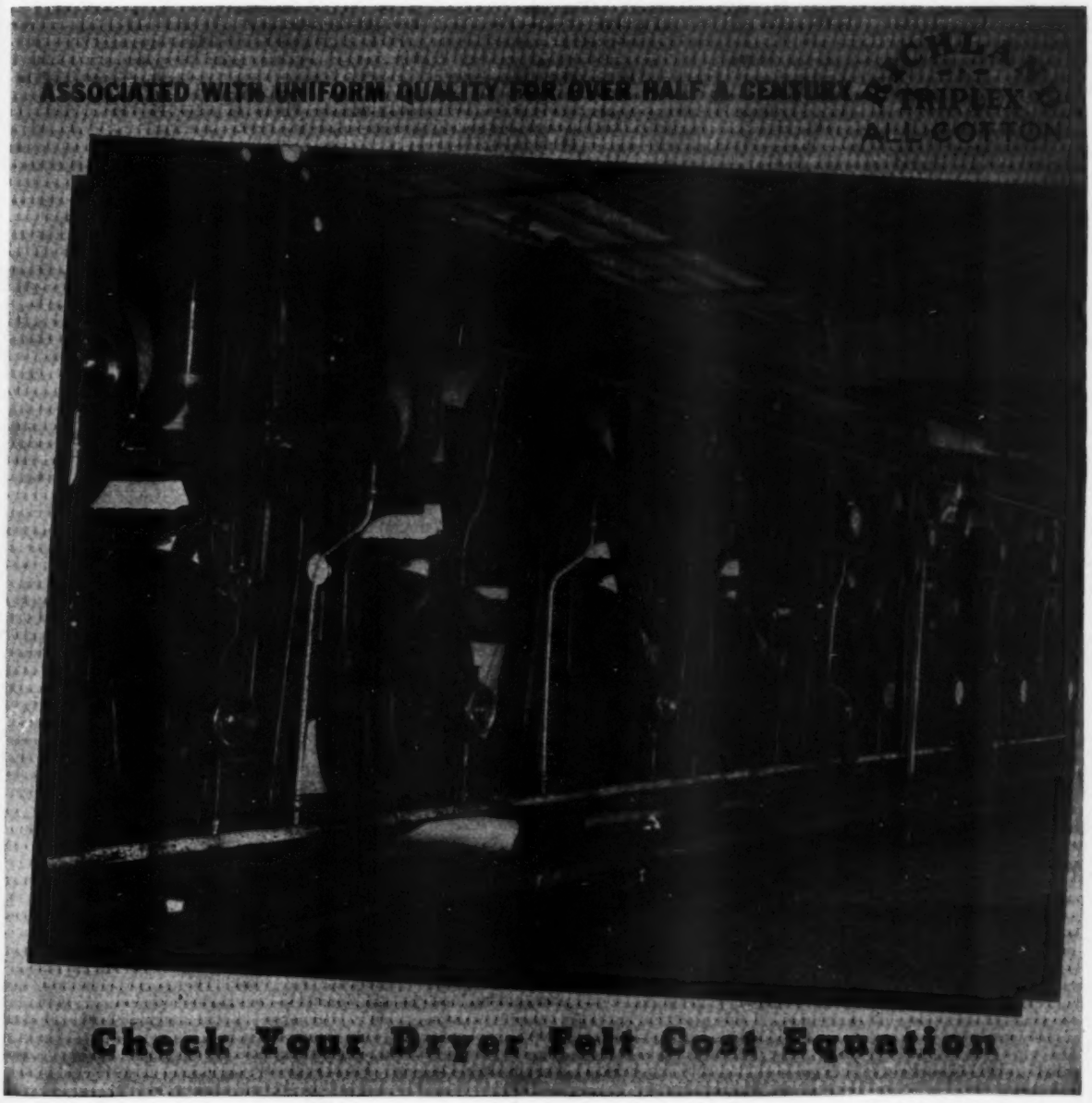
Wet-machine boards.—In order to obtain thicker plies having a better formation than obtainable on the fourdrinier machine, a trial was made with the laboratory wet machine. In this instance the single wet web was allowed to wind around the press roll until the desired thickness was attained and then cut off with a doctor.

The individual plies of boards 29 and 30 were heavy wet-machine boards of high dry and wet-tensile strength made in this way. These cylinder-type boards, made from the commercial southern yellow pine pulp, were either equal or superior in strength to the commercial cylinder boards made from the same pulp. The low dry rigidity and low wet-strength properties of the laminated boards made from them, with only 4 and 3 plies respectively, indicates that it is probably necessary to use an appreciably greater number of plies in order to attain high wet-strength properties. The rigidity values for the dry laminated boards 7 to 16 inclusive made from the series of commercial plies tend, in general, to confirm this indication.

It appears desirable to determine the effect of ply thickness on the properties of the solid fiberboard using commercially-made plies having a tensile strength approximately equal to that of boards 29 or 30.

Limitations of Present Results

Relations and influences of factors cited in this report are only tentative and may be modified or changed as more information becomes available. More information is needed, for example, on various pulps and



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pulp mixtures, pulp processing, agents for increasing wet strength, means of reducing water absorption, laminating adhesives, and various combinations of plies. The laboratory experiments should be confirmed by commercial trials and serviceability tests of fabricated containers.

On the basis of present results, a highly serviceable cylinder-machine board might be made from either commercial jack pine kraft pulp or southern yellow pine kraft pulp processed for high dry-strength, hard-sized with rosin, and treated for wet-strength enhancement with melamine resin, urea-formaldehyde resin, or by other suitable means.

Future Export Markets For U. S. Pulp and Paper*

GEORGE R. COXE, *Pulp and Paper Unit Bureau of Foreign and Domestic Commerce*

▶▶▶ FOR MANY YEARS the United States has ranked as the world's largest manufacturer of pulp and paper, but its export trade has been comparatively insignificant as related to production, representing only about 2 to 3 per cent of tonnage output. Compared with other important pulp and paper manufacturing countries such as Sweden, Finland, or Canada, our exports have been proportionately very small. In general, the United States industry, in the past, has evidenced little interest in export trade. In spite of this, our export business in pulp and paper is of considerable economic importance and certainly cannot be ignored. In the 5-year period 1935-1939, United States sales abroad of paper base stocks and paper and manufactures averaged approximately $40,000,000 a year.

Prewar World Trade

Prior to the war, there existed a surplus of manufacturing capacity in the world's pulp and paper industries in relation to world demand for these products. This situation, coupled with the fact that pulp and paper is produced in many countries, led to strong international competition and a maze of complicated marketing practices.

For many years, Sweden and Finland led the world as producers of pulp for export, followed by Canada, Norway, the United States, Austria, Germany, Czechoslovakia, and a number of other countries. On the other hand, Canada led the world as the largest tonnage exporter of paper, this being primarily newsprint for the United States. Following, in order of importance in 1938, were Finland, Sweden, Germany, Newfoundland (also newsprint), Norway, the Netherlands, the United Kingdom, Japan, and the United States.

The largest import markets for pulp in the prewar period were the United States, Great Britain, France, Italy, Germany, Belgium, and the Netherlands. The largest importers of paper were the United States (principally newsprint from Canada), the United Kingdom, Australia, Argentina, China, India, and France. Although these were the most significant markets, it must be kept in mind that about 40 countries in all imported pulp, and practically every country of the world imported paper, notwithstanding that paper of one grade or another was produced to some extent in nearly every country.

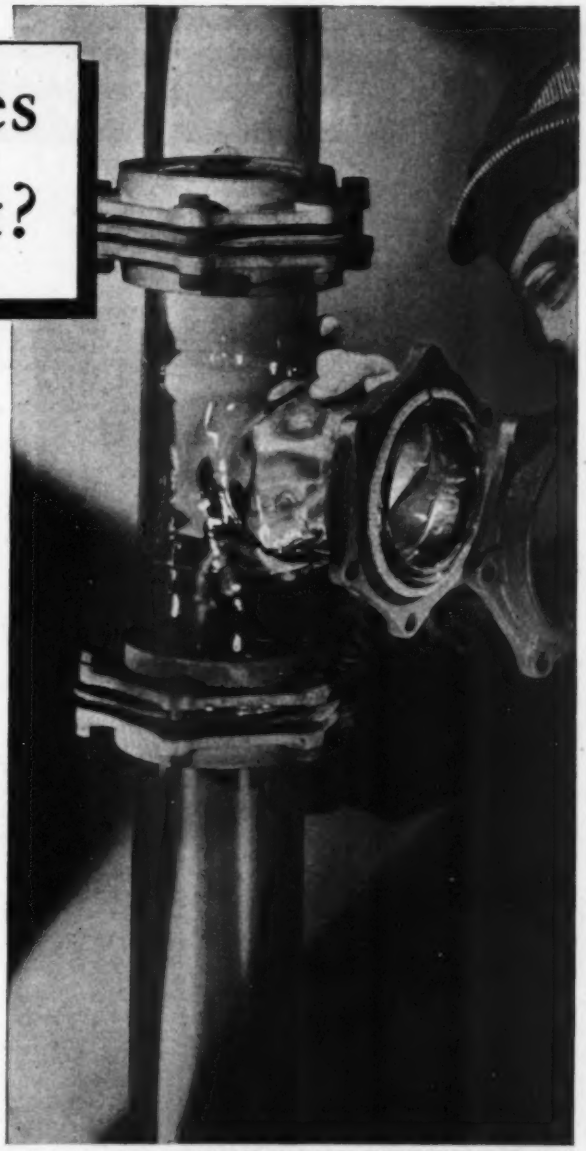
During the period 1929-38, world exports of wood pulp from the principal exporting countries averaged about 5,432,000 short tons per year, of which the United States accounted for 133,000 tons, while world exports of paper and manufactures from the principal producing countries averaged around 5,823,000 tons a year, with United States exports averaging 260,000 tons.

United States Position

The value of wood-pulp exports from the United States rose from $2,729,300 in 1929 to $6,493,140 in 1939. This trend was marked by increases in shipments of the special chemical grades of bleached sulphite pulp and unbleached sulphate

(*) Reprinted from May 13th issue of *Foreign Commerce Weekly*.

How much does *Pyrex Piping* Cost?



How do you figure costs of new equipment? Do you consider it in terms of initial outlay or in terms of overall costs—spread over the length of service it will give you?

On both these counts PYREX Piping is your best bet. The initial cost of PYREX Piping (accessories included) is about the same or less than the cost of full weight copper or brass piping in comparable sizes, and is considerably less than the cost of stainless steel.

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If you are conveying hot or corrosive liquids or gases—if you want to protect products from contamination—if it is important to you to know what is happening inside a line—use PYREX piping.

Approximate cost of glass pipe lines, including fittings, are shown in Table I. These figures should, of course, serve only as a rough guide. The exact amount should be calculated by adding up the cost of the individual parts. (See Page 9, Bulletin 814.)

Corning Engineers will be glad to work with you on your piping problems, to show you how PYREX Piping can be used in your processes efficiently and economically. Write Industrial Sales Dept., PI-9 Corning Glass Works, Corning, N. Y. for PYREX Piping literature or for help on your specific problems.

TABLE I

Size	Approx. cost per foot
1″	$1.00
1½″	1.75
2″	2.10
3″	3.25
4″	6.00

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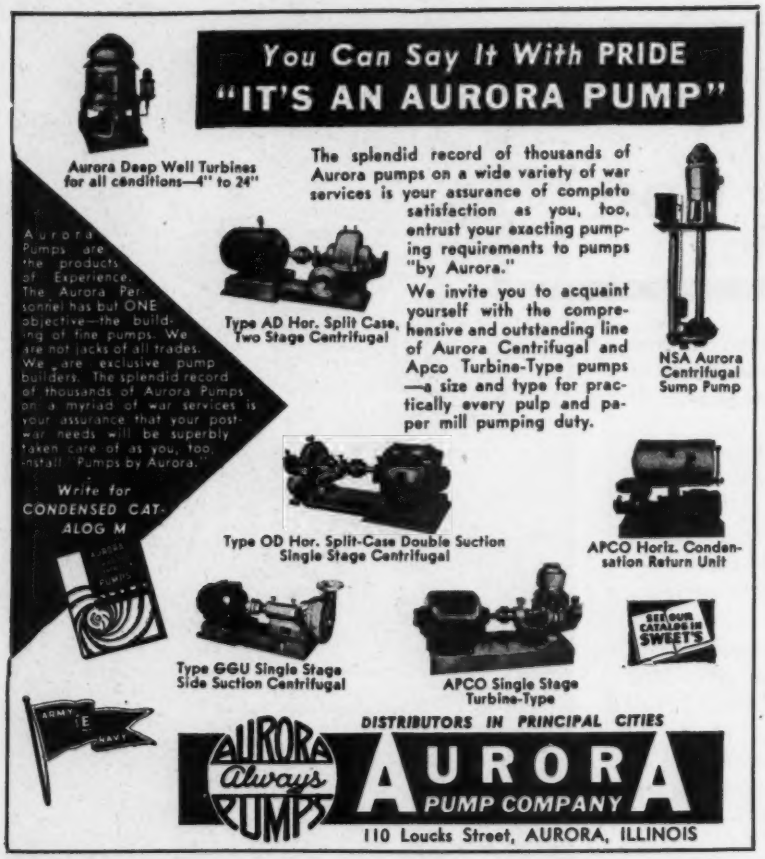
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(kraft) pulp. Exports of special chemical grades of bleached sulphite pulp rose from 48,000 tons in 1939 to 115,000 tons in 1940. Exports of unbleached sulphate pulp jumped from 14,816 tons in 1939 to nearly 159,000 tons in 1940. The principal foreign markets for United States wood pulp in 1939 were Canada, the United Kingdom, Japan, France, Belgium, Brazil, Cuba, Mexico, Australia, British India, Argentina, and Italy, in the order of their importance.

Over the 1929-39 period the value of exports of paper and manufactures fell from $37,086,000 to $30,492,000, but total exported tonnage increased more than 7 per cent. The principal markets for paper in 1939 were Canada, the United Kingdom, the Philippine Islands, Cuba, Mexico, Argentina, the Union of South Africa, Venezuela, the Netherlands Indies, Columbia, China, Australia, Brazil, and British India. The numerous other countries buying United States paper and manufactures each took less than $500,000 worth during 1939. During this 1929-39 period, tonnage exports of printing papers declined 23 per cent (the drop being mainly in newsprint); wrapping papers increased 36 per cent; writing paper increased 35 per cent; other papers increased 22 per cent; building papers and boards increased 25 per cent; and paperboards increased 44 per cent (entirely on account of container and boxboards). Total exports of converted paper products remained practically unchanged, the losses in envelopes, boxes and cartons, and papeteries being approximately balanced by gains in sanitary tissue products and paper bags.

Postwar Prospects

What are prospects for this trade in pulp and paper after the war? In "Foreign Trade After the War"[1] a purely hypothetical statistical projection indicates a possible export in 1948 of $27,300,000 of paper base stocks, a gain of 133 per cent over 1938, the last normal prewar year; and of $59,500,000 of paper and manufactures in 1948, an increase of 130 per cent over 1938. This projection assumes 1948 to be the third postwar year, following a period of world rehabilitation and adjustment.

On the basis of total exports of $7,000,000,000, a hypothetical distribution of exports by commodity groups was made in accordance with their past relationship to the total. In the case of paper and paper products the correlation during the 11-year base period 1929-39 was reasonably close. This may be accounted for by the fact that exports of these products are made to many countries throughout the world, and since paper consumption in most countries varies in proportion to general economic conditions, it is reasonable to assume that paper and paper-product exports followed, in general, the trend of total exports of all commodities.

On the other hand, there was little close relationship between exports of paper base stocks (of which wood pulp is the principal component) and total exports of all commodities. During the 10 years prior to 1938, Japan took annually from 50 to 85 per cent of our total exports of wood pulp (primarily rayon grades of bleached sulphite) so that this single country exerted a major influence upon total exports of paper base stocks. Since total exports of commodities to a single country, such as Japan, do not necessarily follow the pattern of total exports to the world, the projection into 1948 for paper base stocks seems questionable.

The hypothetical projections for exports of pulp and paper are, however, not unreasonable. Exports of paper and manufactures amounted to $86,983,000 in 1919 and to $89,072,000 in 1920, postwar years of World War I. By 1940 the export demand was already influenced by business that before the present war went to other supplying countries. Our exports of paper and manufactures in 1940 were valued at $65,128,000, well in excess of the projected $59,500,000 for 1948. United States exports of wood pulp in 1940 amounted to $29,737,000 as against $27,300,000 projected for 1948.

Determining Factors

The extent of the United States export trade in pulp and paper in the postwar period will depend primarily upon (1) domestic demand and the capacity to supply it plus an additional supply for export; (2) the extent of increase in world demand due to generally increased economic activity, industrialization, and social advances in terms of education and literacy; and (3) foreign production and supplies in relation to world demand upon which the degree of price competition and profitable trade will depend.

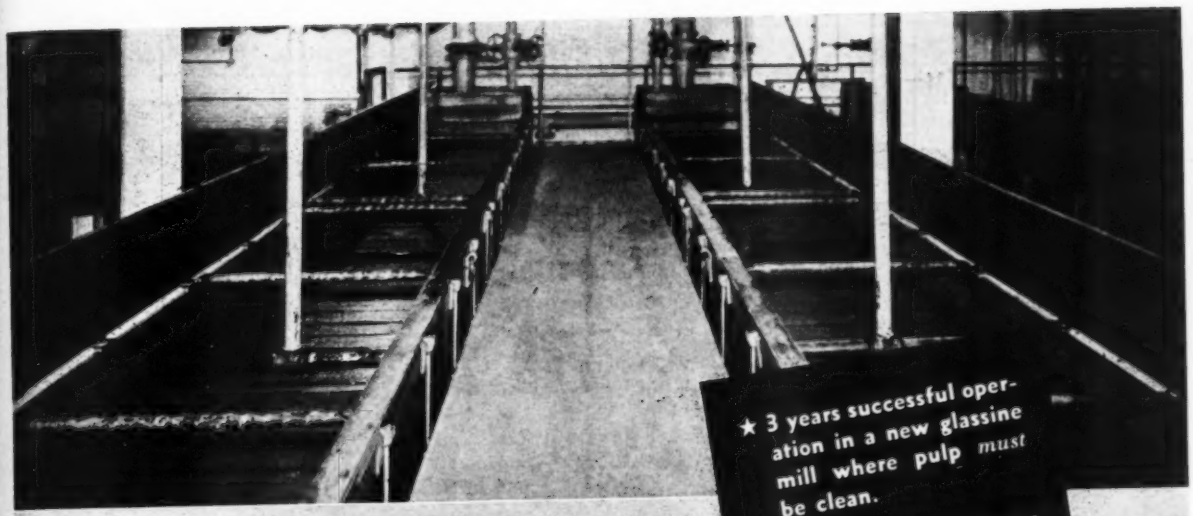
Demands on U. S. Mills

What will be the position of the pulp and paper industry during the immediate postwar period when industry as a whole will be reconverting its plants and resuming its normal peacetime activites? Will there be a sharp drop in orders and production? The pulp and paper industry itself has no mechanical reconversion problem because its plant equipment could not be converted to the manufacture of other goods.

The anticipated cessation of hostilities in Europe some time before the end of the war in the Far East will tend to ease the impact of any sudden cancelation of all war requirement. Another factor which will tend to offset the effect of the cancelation of war orders will be the demand caused by replenishing of depleted stocks of practically all types of paper. There may be a drop in direct domestic consumer needs for some types of paper. For example, during the period of general reconversion the over-all demand for packaging materials may be reduced. Likewise the timing of reconversion may have great influence on the variations in the demand for different grades of paper.

But it is likely that the unsatisfied overall demand will be so great that such decreases will not bring total demand below

(1) Published by Bureau of Foreign and Domestic Commerce, Department of Commerce, October, 1943.



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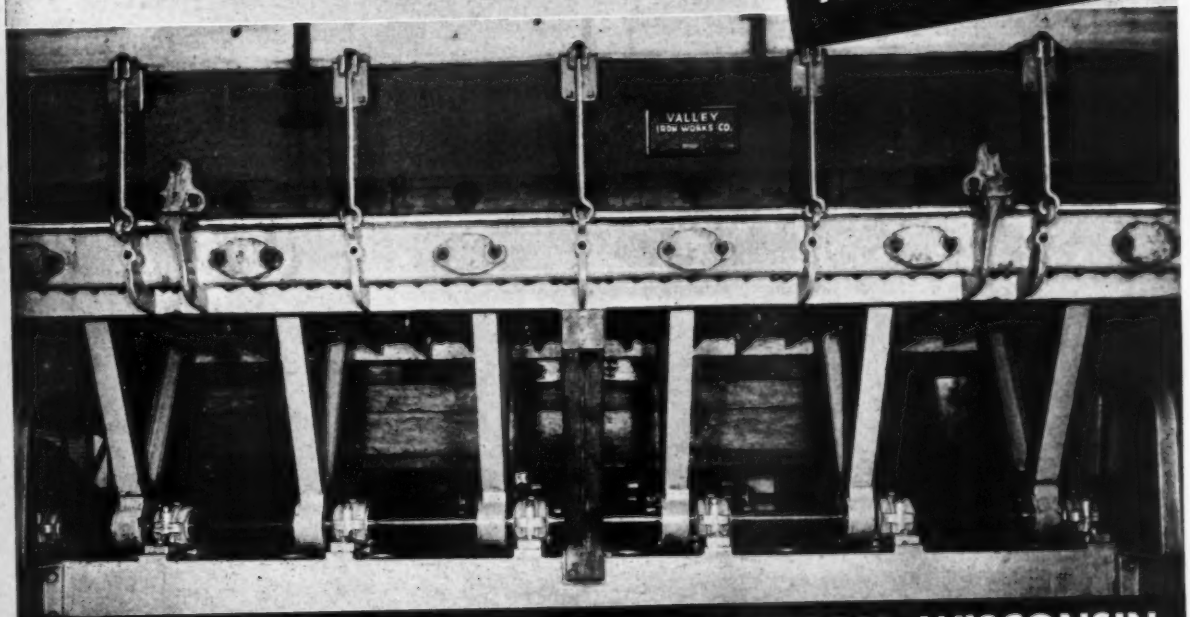

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the production capacity of the industry in the immediate post-war period. The factor which will have the greatest influence at that time on production will be the supply of pulpwood. How long it will take to bring pulpwood cutting up to prewar levels is problematical. Even with an increase in wood cutting, it normally takes about a year before the tree is converted into paper.

All in all, the capacity of the pulp and paper industry will be taxed (1) to meet the pent-up demands for all types of paper made scarce during wartime, (2) to replenish depleted inventories, and (3) to meet the indirect export demand.

Varied Influences

As reconversion progresses, the domestic requirements for paper will increase in like proportion. The demand for such goods, unsatisfied during the war, plus the pent-up purchasing power throughout the country, will, in all probability, create an unprecedented volume of civilian orders and, as these goods are manufactured, a corresponding demand for paper. War requirements have developed many new uses for paper and many new products, such as weatherproof fiber shipping containers, and undoubtedly post-war developments will create considerably more new uses. Moreover, Europe, the Far East, and Latin America will, while European mills are being rehabilitated, look to the United States for fulfillment of a large part of current demand as well as for the replacement of stocks of paper unobtainable during war years. In addition, there will be the indirect export demand for packaging the food and other items urgently needed by the war-torn countries of the world.

At present all indications support the assumption that there will be no surplus supply of pulpwood, pulp, or paper in the United States for at least two or three years after the war in Europe ends. It may take as long as five years before production returns to normal in all European countries. Unless current trends are radically changed, inventories of wood, pulp, and paper will be at extremely low levels when peace comes, and about two years of normal production will be needed to replace them.

Thus, while domestic consumer demand may decrease somewhat during the immediate postwar year or two, the replacement of inventories plus the direct and indirect export demand is likely to exceed the domestic capacity to supply it.

Geographic Point of View

There is no reason to believe that with the cessation of hostilities there will be any sudden or important geographical change in export markets for United States pulp and paper as compared with 1938, except that Japan will probably not be in a position to resume buying the special grades of bleached sulphite pulp. There is, however, the distinct probability that Australia, New Zealand, China, India, and other Far Eastern countries eventually will become increasingly important buyers of United States paper and paper products.

As a result of the war, United States products of many kinds, including paper and paper products, are becoming favorably and increasingly well known throughout the world, with the American soldier playing the part of super-sales man. American manufacturers are gaining valuable knowledge regarding the varying requirements for suitable export packaging for different markets, which is a potent factor in building goodwill.

Domestic Production Capacity

Prior to the war, there was considerable excess (in relation to demand) of domestic manufacturing capacity in the pulp and paper industry. Few mills were able to maintain production at full capacity. This situation was particularly true with reference to wood pulp. Illustrative of this country's capacity to produce paper, the output in 1941, the peak of the current war period, was more than 60 per cent over that for 1938. However, immediately after the war a considerable part, if not all, of the old marginal capacity now pressed into service will probably go out of production as new, more efficient equipment and mills are built.

Because of shortage of maintenance and repair materials, inexperienced labor, and pressure for maximum production during the war, pulp and paper machinery will be in need of extensive overhauling, relacements, and modernization. For these purposes and for new mills and equipment, it has been estimated, through a survey conducted by *Paper Mill News* that the in-

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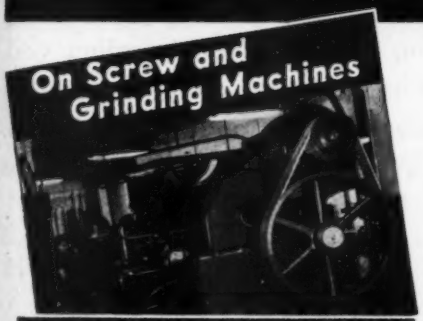

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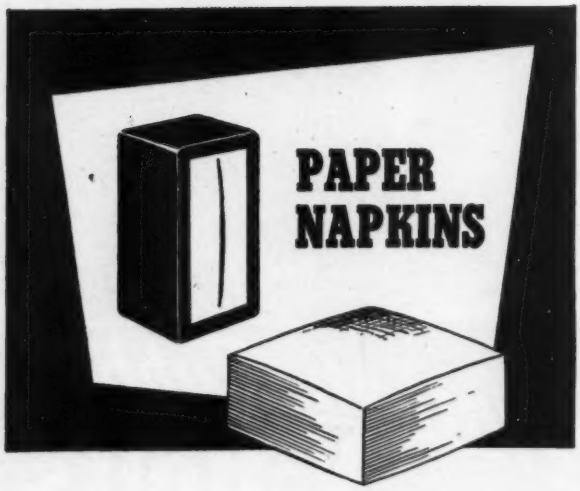

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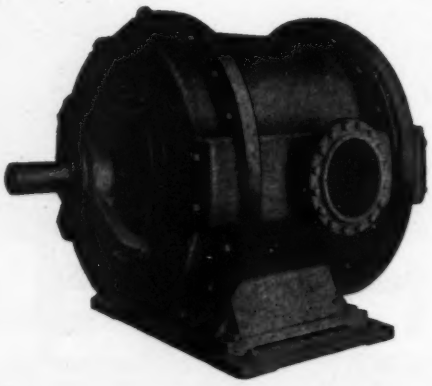

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dustry plans to spend $200,000,000 during the first post-war year. (This is a purely statistical estimate based on a fair sample of the industry.) The total includes the cost of several new integrated mills for the production of newsprint, paperboard, insulating board, and specialty papers which are likely to be built in the South. In addition, there is the possibility of one or two new mills being built in the west-coast area and two new United States-owned pulp mills which are already planned for Canada. No estimate of the production capacity of these new mills is available, but, plus the modernization of existing equipment, the increase in the total capacity of the industry will be considerable.

Thus, with this program of expansion, when the peak of the early post-war demands has passed, the industry may find that again its capacity is greater than domestic demand. Such a possibility should prove to be a potent factor in influencing industry to become more "export-minded" than in the past.

Effect of Industrialization

Experience has shown that the increase in consumption of paper in the United States over a period of years is closely related to the rising index of industrial production. It can safely be assumed that such a pattern is followed in other countries and that their consumption of pulp and paper will depend in large measure on an increase in industrialization. Greater education resulting in a wider culture will also increase the consumption of paper

The ending of normal international trade with the outbreak of war placed many countries in a position where they have to rely mainly on their own production to supply the local demand for goods previously imported. This has led to greater industrialization and consequently larger income. Although some of these new factories produce pulp and paper, the generally increased purchasing power will create a greater over-all demand for paper, albeit the requirements may be for grades differing from those imported in prewar years. It is probable that this expansion in industrialization will continue with the return of normal conditions after the war, but progress is slow in countries which are largely agricultural or primarily producers of raw materials.

World Production vs. Demand

In 1937 world exports of wood pulp from the 16 principal exporting countries amounted to some 7,231,00 tons. This was about 28 per cent of total pulp production of around 25,662,000 tons in these same countries. The United States share in this export trade was 323,000 tons, or only 4.5 per cent.

In the same year, world exports of paper, paperboard, and manufactures, as measured by exports from the 16 principal exporting countries, was around 7,397,000 tons, being 26 per cent of total production in these countries, estimated at 28,090,000 tons. United States exports of paper, paperboard, and converted products in 1937 amounted to 224,000 tons, representing only 3 per cent of world exports.

The following table shows production and exports of pulp paper, and paperboard from the principal producing countries in 1937:

Ravages and Repercussions

Though it is known that some pulp and paper production capacity in certain countries, particularly in Europe, will have been damaged, the post-war outlook is for a substantial larger world manufacturing capacity after rehabilitation than existed before the war. This capacity may in time exceed consumption even though per capita use is increased and new markets developed.

Damage to some of Europe's forests, particularly in central Europe, will probably have been extensive both from direct war damage and from overcutting. Since these forests are extremely valuable national resources, it is possible that government restrictions may be placed on pulpwood cutting and have greater effect on pulp production than will damage to the pulp mills. Another factor that, in all probability, will have great bearing on European pulp production will be the diversion from pulp mills of huge quantities of timber for manufacture into lumber for the rebuilding of the devastated regions.

With the world-wide demand for all types of materials, the length of time it will require to completely rehabilitate the entire European pulp and paper industry is problematical. Even if the mills could

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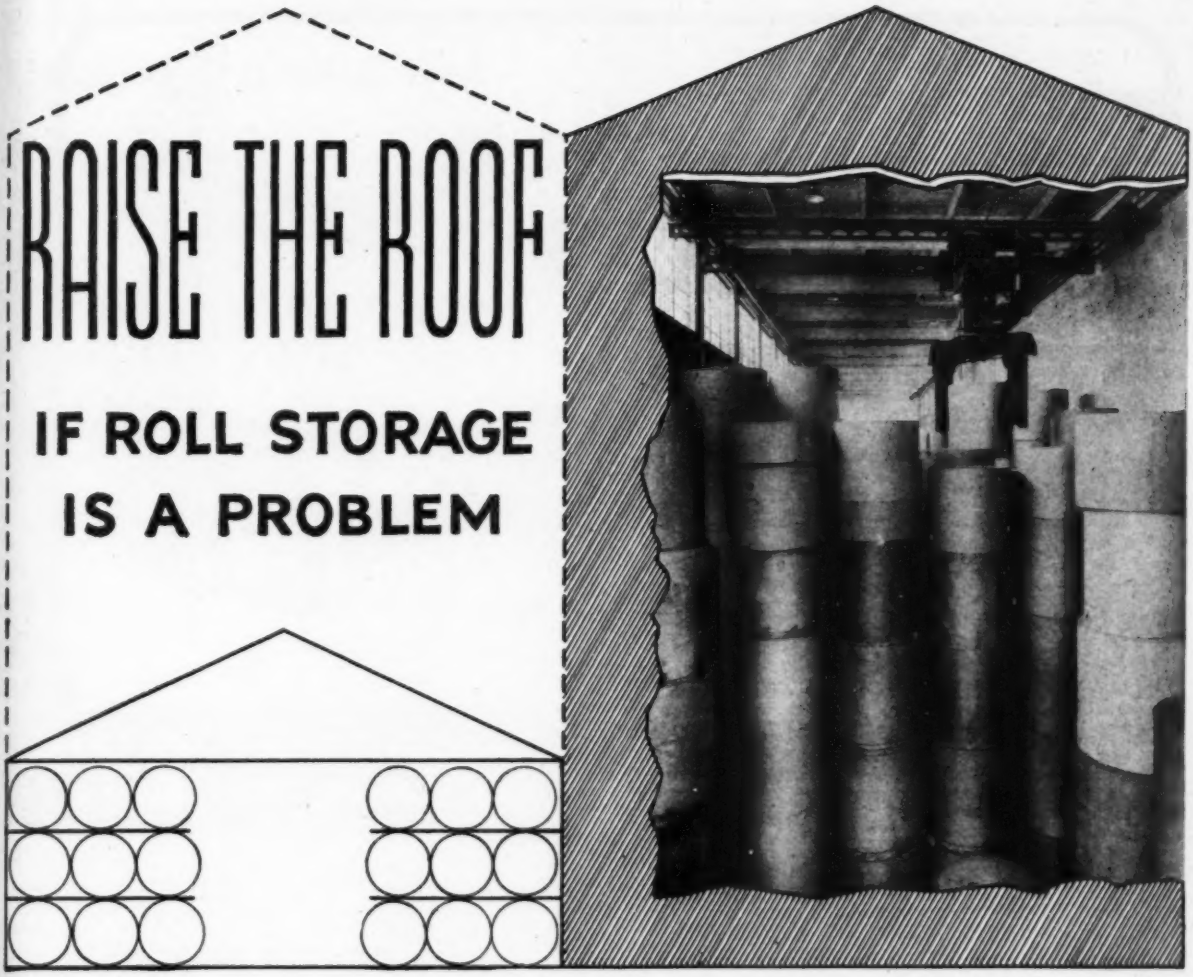
IF ROLL STORAGE IS A PROBLEM



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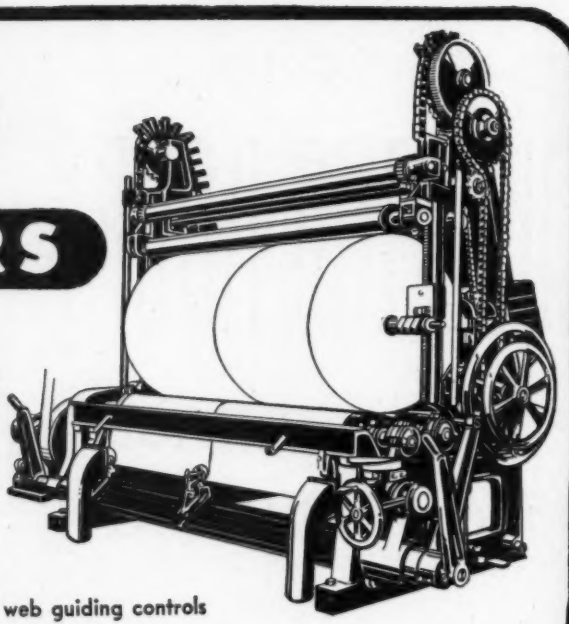

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be quickly put back into operation, the European demand could absorb the entire production for some time.

The defeat of Germany and the ending of hostilities in Europe will have little immediate effect on the pulp and paper industry in the United States. A limited supply of Swedish pulp may become available to augment the domestic supply. The European needs for paper and board, both direct and indirect, plus domestic requirements increased by the easing of war restrictions on use, will create a demand probably exceeding any previously experienced. For an indefinite period immediately after the war the United States and Canada will continue to be the major sources of supply, but increasing quantities of pulp and paper will become available from Sweden.

What We're Likely to See

All indications lead to the assumption that, for several years after the war, world demand for pulp, paper, and paperboard will exceed world production capacity; with the rehabilitation of the world's industry, supply will equal demand for an indefinite period; but eventually further increased manufacturing capacity will probably cause potential supplies to exceed world demand.

The immediate post-war demand for United States pulp, paper, paperboard, and paper products will undoubtedly continue unabated until the European industry is rehabilitated. This presents an unparalleled opportunity to United States manufacturers and exporters to develop and retain foreign markets. However, American paper manufacturers have, in the past, shown little interest in exporting their products at the low-priced competitive levels of the foreign exporters, and it remains to be seen whether competitive prices, tariffs, and the many other factors affecting the profitableness of export markets will allow this interest to grow.

Convention Papers . . . Abridged

Operation and Performance of a Controlled Vat System

O. C. CORDES, Sales Engineer
Downingtown Manufacturing Co.

Paper mills are now successfully controlling the preparation of the furnish to the cylinder board machine, resulting in a substantial improvement of product and reduction in costs for the same type or even lower grades of raw materials.

The next step in order is a controlled sequence of mixture and flow from the machine stock chests into and through the vats. The author will endeavor to describe such a system together with the effects to be obtained thereby. The system from the stock chest to the vat will be substantially the same for either counterflow or uniflow vats. However, since the subject is quite broad, we will limit this discussion to the counterflow type, which is the most versatile as it readily and easily handles a wide range of weights and classes of furnish; and at the present time is producing the major portion of all classes of board made.

In Figure 1 we show a simplified cut away drawing of such a system. There are three kinds of stock involved, i.e. top liner, back liner and filler. These stocks are pumped continuously from their respective chests to a head box through pipes of such size and design as to give a minimum loss in friction head; and this head box functions only to establish the desired constant head against which the stock is pumped, the overflow returning directly to the several chests. At each vat a special three gate valve is inserted in the three

This is the fourth installment of abridgments of papers presented at the annual meeting of The American Pulp and Paper Mill Superintendents Association, held in Chicago, May 24-26, 1944. More of these abridgments will appear in future issues.

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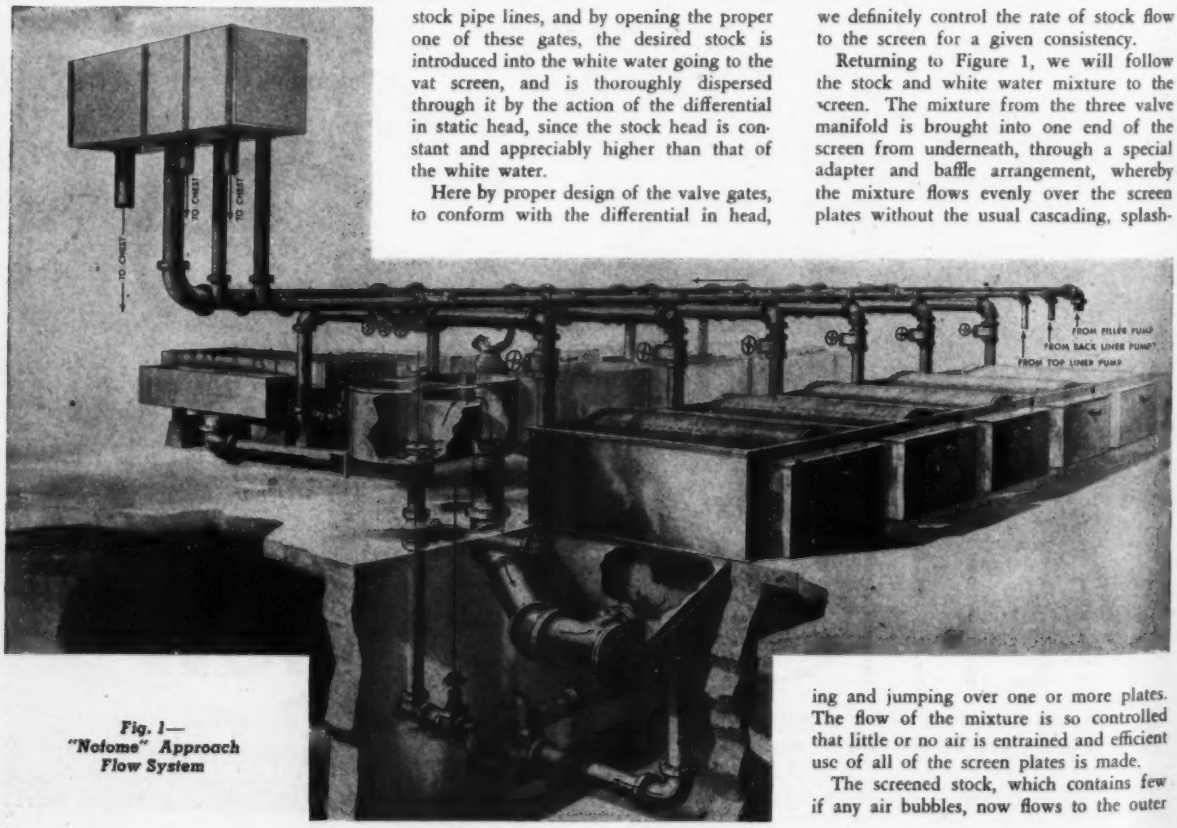

Fig. 1— "Nofome" Approach Flow System

stock pipe lines, and by opening the proper one of these gates, the desired stock is introduced into the white water going to the vat screen, and is thoroughly dispersed through it by the action of the differential in static head, since the stock head is constant and appreciably higher than that of the white water.

Here by proper design of the valve gates, to conform with the differential in head, we definitely control the rate of stock flow to the screen for a given consistency.

Returning to Figure 1, we will follow the stock and white water mixture to the screen. The mixture from the three valve manifold is brought into one end of the screen from underneath, through a special adapter and baffle arrangement, whereby the mixture flows evenly over the screen plates without the usual cascading, splashing and jumping over one or more plates. The flow of the mixture is so controlled that little or no air is entrained and efficient use of all of the screen plates is made.

The screened stock, which contains few if any air bubbles, now flows to the outer

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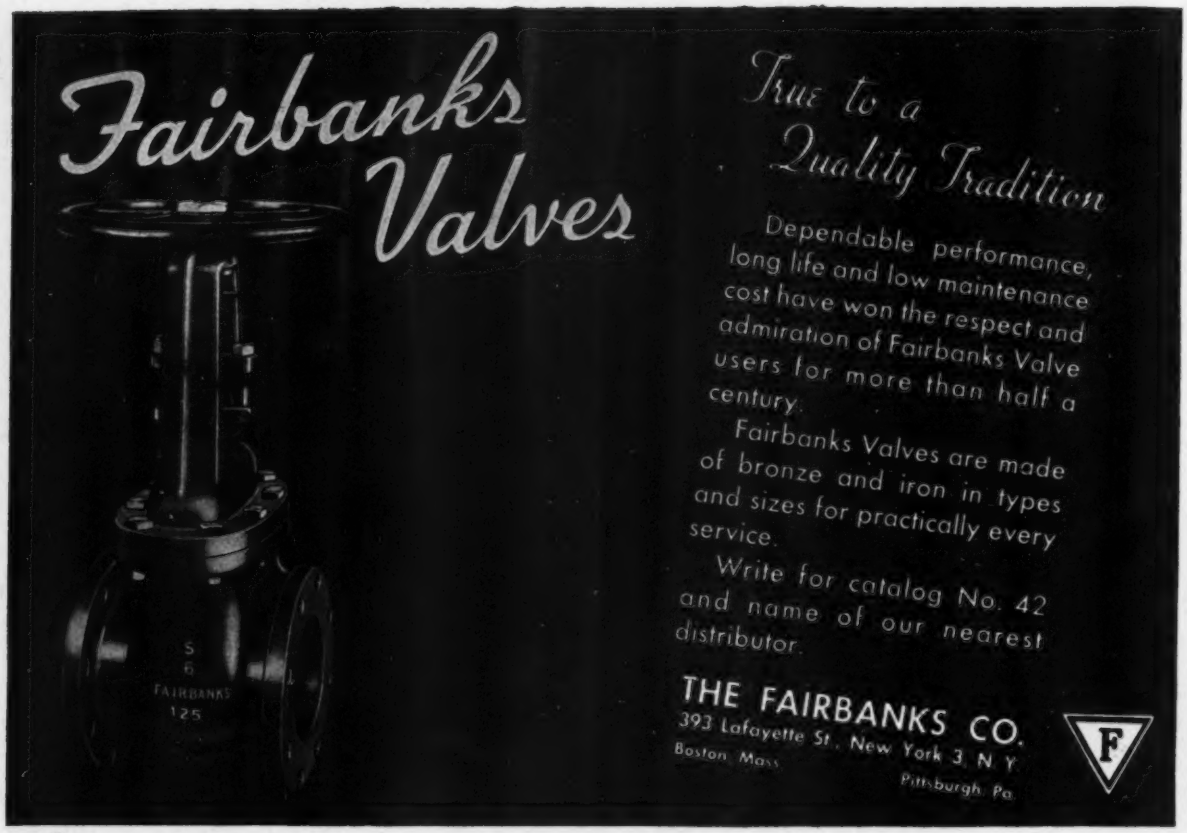
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Figure 3 ——→

circle of the mixing head under the stainless steel mix box, and as it wells up into the cylindrical mix box proper, is thoroughly mixed with the high velocity white water radial squirt being released by the weighted valve. Here again the mixture is controlled to provide a thorough mixing by the violent agitation set up from the velocity head of the white water, to eliminate any entrained air as the mixture moves away from the center toward the overflow dam and to eliminate any air induced foam.

The white water is delivered directly from the vat to a pump selected with a capacity as required for one tenth of one per cent furnish to the vats, which is preferably driven by a variable speed motor. In this manner, the amount of water to be taken from the vat can be closely controlled with good operating efficiency. From the pump the white water is piped through the three gate distributing valve manifold to the screen, and to the mix box mixing head. A valve in the line to the screen together with the weighted valve of the mix box determines the amount of water going to the screen and the remainder of the water is delivered by the weighted valve to the mix box.

In order to control the flow of the furnish from the mix box to the stainless steel vat the stock pipe is designed to produce the proper velocity of flow for the tonnage output and product of the vat, and the mix box hydraulic head is set to provide the required flow without more than 3 or 4 inches of head. This controls the velocity to the proper rate to prevent bunching of the fibers and prevents entrainment of air as it goes over into the vat.

At the vat entrance, the furnish is received at right angles into a stock inlet which gradually and uniformly spreads it out up into the vat. With proper design

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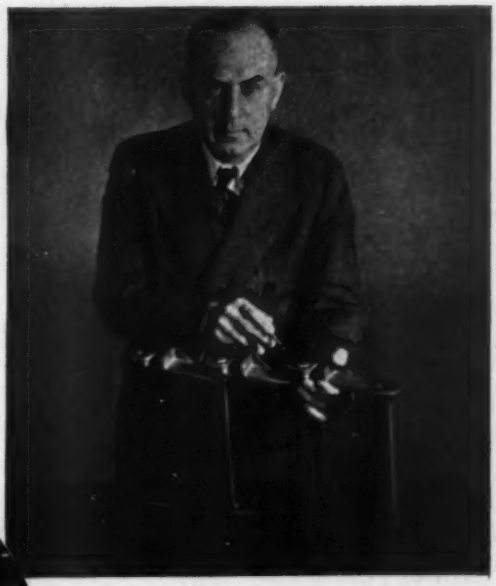

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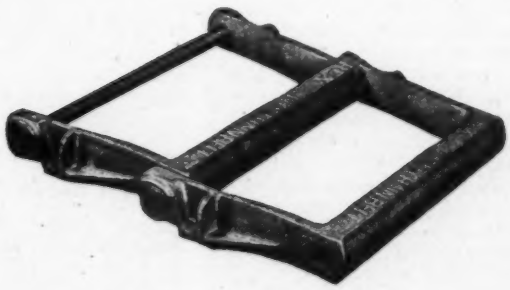

❸ THERE ARE OTHER ADVANTAGES to Rex Riveted Mill conveyor chain. Note the close-up. Links are ideally designed one-piece castings. Inner barrel face is rounded for good sprocket action, and the carrying face is flat to avoid any tendency to ride over the material. T-head rivets are locked into the side bars to prevent turning.

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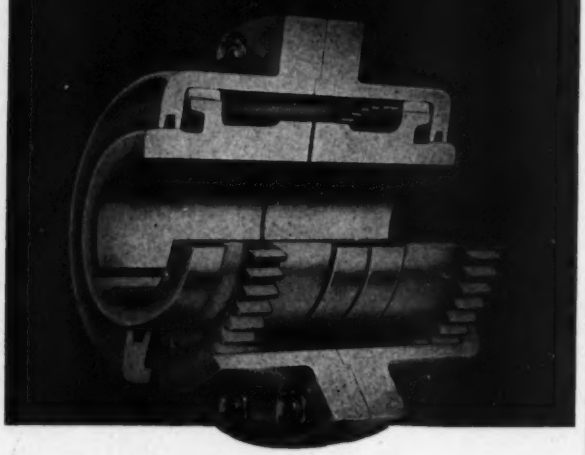

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and proportioning the spread of the furnish can be controlled at this point which is very important. The furnish now rises to the making board of the vat and passes over it into the vat circle. On the way up it encounters two adjustable baffles, specially shaped for slip flow, so that the velocity can be varied and the turbulence controlled and reduced to the desired operating flow for good formation. The upper baffle has the greatest effect on the turbulence and is more often adjusted.

Figure 3 shows a stainless steel vat of the latest design. The vat body carries no external weight. The cylinder mold and the couch are all supported on cast iron stands which are fastened to the sole plates. The controls for adjusting the baffles are shown on the side of the vat. The making board of this vat is adjustable up or down so that the head and flow into the circle can be adjusted a small amount.

The furnish passes over the making board and into the space between the cylinder mold and the circle, and on its way encounters the Puette Rectifier which is located near the bottom of the front part of the circle. The control for this can be seen at the bottom of the water box. This rectifier may be likened to a valve in that it can be moved toward or away from the cylinder mold for its full length of face, thereby opening or closing this space. The operation of the rectifier changes the initial head and the rate of flow to the back of the circle and this together with the drainage rate determines the speed and quality of formation. The rectifier by increasing the velocity at its point of location causes lumps and fines to be washed from the surface of the formation and levels out the sheet. It is important that the width of the back part of the circle opening be large enough to prevent undue agitation or eddy flows at this point causing streaking and uneven formations, for here the main portion of the sheet is formed.

The drainage rates have been determined for various furnishes by actual tests, and knowing the types of furnish to be handled and the production, the diameter of the cylinder mold can be arrived at with reasonable accuracy. This is important as a mold can be too large as well as too small with a resulting poor formation.

The absence of cascading and splashing with the controlled vat system results in a very much cleaner mill, particularly around the screens back of the machine. Also, the fact that the stock control valves are directly back of the machine reachable from the floor level, makes it much easier and quicker for the operators to effect changes in weight, etc., than with the old system of head boxes and gates. This has resulted in an appreciable increase in actual machine production, largely because of the ease in changing orders.

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The primary purpose of a washing system is to wash the pulp clean and at the same time use a minimum quantity of fresh water. Poorly washed pulp not only results in high soda losses, but also poor screen room operation due to foam. More im-

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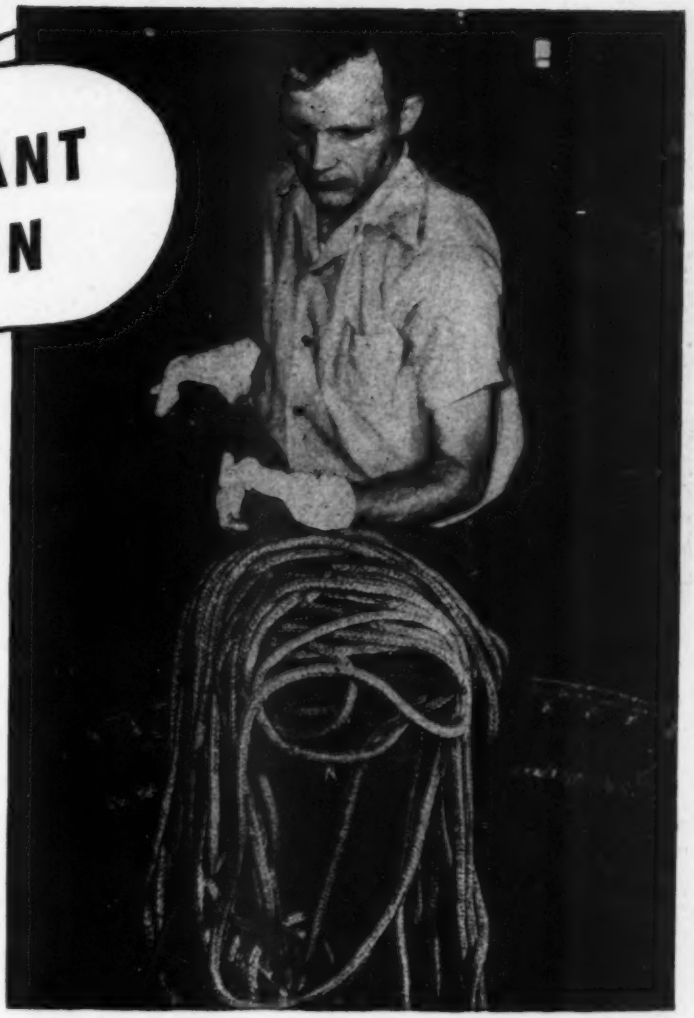

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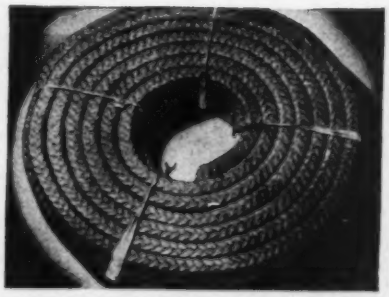

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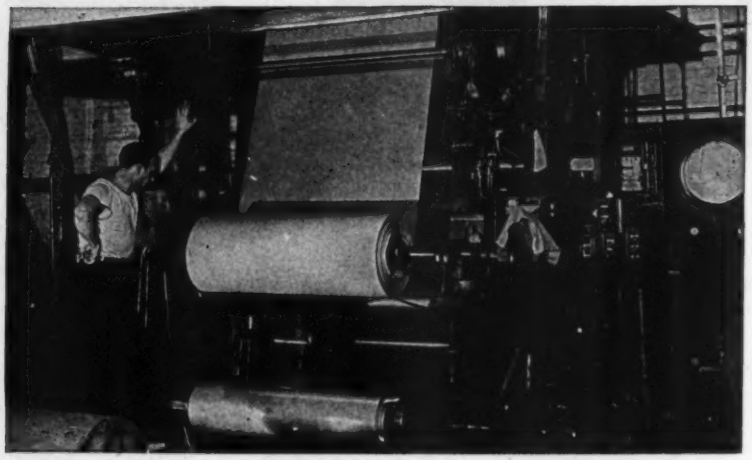

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portant is the adverse effect on the paper test. In many cases the order is reversed, and undue attention is given to making a strong liquor for the evaporators rather than clean pulp.

The flow of pulp and liquor is through 3-stage continuous vacuum washers, and results actually obtained over a considerable period of time will illustrate the method of economical operation.

The pulp is discharged into a conventional blow tank with bottom agitator and is diluted to approximately 2 per cent at the agitator part of the tank. The density is further reduced with weak liquor to 1 per cent at the primary washer. Weak liquor from the second washer is applied to the primary washer and the intermediate repulper. Weaker liquor from the third washer is applied to the second washer in the repulper following this washer, and fresh water is added only on the third washer. There is no outlet of liquor from the system to the sewer; in other words, this is a closed system.

In order to insure satisfactory results, a few simple rules should be followed. First of all, it is assumed that the consistency and volume of the pulp entering the washer is well regulated. The same principles which apply to modern cylinder machines are also necessary for a a pulp washer; namely correct washer inlet design and velocity and clearance between the vat and the cylinder. Observance of the above fundamental rules will result in satisfactory sheet formation and consequently economic washing of the pulp. Conversely, if sheet formation is poor, washing will be nonuniform, soda loss high and liquor weak and foam trouble aggrevated.

Addition of black liquor during the blowing cycle is an advantage—i.e, if sufficient liquor is added so that the stock in the blow tank is reduced from 10 per cent to 6 or 7 per cent, the stock will wash more readily. The practice is borrowed from pan operation, where it was found that keeping the unwashed pulp in a more liquid state speeded up the washing cycle.

Thorough removal of liquor from the stock is not accomplished merely by displacement. This is due to the fact that soda is not all readily soluble, also coarse particles in the sheet interfere with even penetration of liquor or water. To overcome this condition, a certain soaking time is required, therefore, it has been found essential to break up and scrub the pulp between stages by means of a special repulper. The design of this part of the equipment should be such that the agitator is fully submerged in order to eliminate air which causes foam and prevents proper formation on the next cylinder. Three washers and two intermediate special repulpers generally give satisfactory results when washing pulp cooked for wrapping paper or bleaching. However, a soaking tank ahead of the last washer would unquestionably reduce the amount of fresh water required and consequently increase the liquor strength and give cleaner pulp than without the soaking tank.

The salt cake content of the pulp leaving the first washer is approximately 500 pounds per ton, leaving the second 50-100 pounds per ton, and the last 15-20 pounds per ton. Pulp for paperboard is of course more difficult to wash for the reasons mentioned above—namely, because it contains many coarse fibers from which the soda is not readily removed and the only way in which it can be removed from this type of pulp is by additional soaking. This point has been proven in a specific case by the installation of a stock chest ahead of a final washer so that the pulp receives about 30 minutes retention time. Previous to the installation of the chest, the salt cake content was 60 pounds per ton; the chest reduced this to 30 pounds per ton. All salt cake figures mentioned are determined by an ash test so as to include the insoluble soda.

In order to reduce to a minimum the total water consumption in the brown stock end of the mill, it is feasible to use effluent from the screen room on the last washer repulper ahead of the washed stock. The only overflow to the sewer is from the white water chest in the screen room.

An important factor which has improved operation materially is better and wider use of control instruments. These include a consistency regulator, liquid level recording gauges and fresh water meters and liquor meters. Some operators use a sheet thickness gauge, but a stock volume meter is much more accurate. A continuous *p*H recorder operating on a continuous sample

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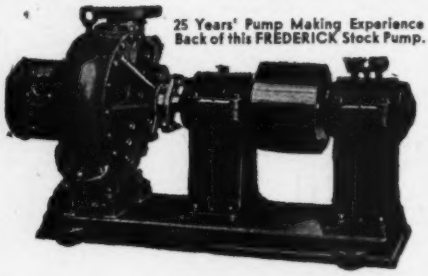

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of washed pulp is another possibility.

The elimination of vacuum pumps together with traps, receivers, etc., has not only saved power but reduced tendency to foam. It is difficult to eliminate foam altogether, but by exercising moderate care in mixing the stock with liquor under submergence, it can be reduced so that there need be no foam in the washer vats nor in the yard adjacent to the liquor tanks. The filtrate tanks which receive the liquor from the washer are now designed so that liquor entering the tank receives a minimum of agitation. Several effective breakers have been devised for reducing the foam and they also allow the use of smaller liquor tanks.

The question often arises "How long is it possible to wash pulp and maintain an economical operation?" This depends on local conditions including cost of steam, but with the advent of quintuple and sextuple effect evaporators the cost of evaporation is extremely low, particularly in the South.

Stock Preparation Problems Pertaining to Facial Tissue

KURT WANDEL, Consulting Engineer

While modern fourdrinier machines make facial tissue at speeds up to 1,500 fpm, there are still cylinder machines running the same grade as slow as 300 fpm. There are no such variations on any other grade of paper either in machine speed or in the machines themselves. The closest to this difference in production occurs probably on toilet and napkin papers. In both these latter tissues, the quality standards will vary considerably while facial tissue is at least supposed to be of the same quality.

Basically, the problem is to treat the fiber for facial tissue very lightly, sufficiently so to allow it to be formed-in uniformly and have the sheet take on limited strength without allowing it to become harsh. A great deal of the ultimate softness of facial tissue comes through the sheet adhering to the dryer surface sufficiently well so that its structure is softened up through its resistance to being scraped off by the edge of the creping doctor. The best adhesion to the dryer surface may be had in a sheet formed of free stock. Adhesion is not equal in sheets made from any sulphite or soda pulp. The latter, for instance, is not suitable at all except for a part filler stock. Hardwood sulphite has too short a fiber and long-fibered sulphite has to be treated too much for proper formation which is apt to make the sheet harsh. Standard grades of northern "hard" bleached sulphite are the best for facial tissues. Alpha pulp was once considered essential for high grade facial tissue on account of its ability to be reduced in beating or jordaning without losing its inherent fiber structure and to still produce a soft tissue, but, alpha pulp is no longer essential for best results.

The type of paper machine on which facial tissue is made and the speed of the machine have a distinct bearing on the stock preparation methods to be followed for best results. If we consider cylinder machines first, we may presume that they are operated within a range of from 300 to 500 fpm and consequently may be furnished with stock prepared in a similar manner. This may best be done in a regular beater equipped with bars at least ½ in. wide and furnished at a medium to low consistency, about 4%. The formation of the sheet on the cylinder mold with free stock is helped by reducing the forming area to a few inches toward the top of the mold before the sheet leaves the stock level. To accomplish this, a slight vacuum is maintained in the cylinder mold. With this arrangement, very little stock preparation is required. In addition to the beater, a slow speed refiner may be used. Jordans are not necessary.

Fourdrinier machines making facial tissue usually are limited in speed on account of formation. If the stock is too free, formation becomes bad or the sheet cannot be picked up and when the stock is slow, the sheet becomes harsh or is hard to crepe uniformly. Slow stock definitely limits the drying capacity of the Yankee dryer. The inlet has more to do with limitation of speed than stock preparation. At speeds from 500 to about 800 fpm, no particular type of inlet produces outstanding results. Stock preparation is adjusted to best formation and quality of sheet. A combination of beater and slow-speed, broad knife refiner opens up the fiber and with a slight brushing out in a small Jordan, will produce best and sometimes very satisfactory results.

It is on the higher machine speeds that a different type of inlet can be used, and

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vice versa, this different type of inlet accounts for the higher speed. Instead of shooting the stock into the wire horizontally, the stock is directed toward the wire at an angle of about 30 degrees which contributes to about half the water passing through the wire at once and the balance a short distance beyond. The fiber is forced to form against the wire and is held there until drainage is complete. The higher the speed of the wire, the greater the nozzle velocity or pressure of the stock and the better results in good formation. The stock will have to be treated but little, except in a large refiner working in connection with a pulper and chest. The water in the sheet not only drains but evaporates more readily on the dryer and contributes to increased drying rates taking care of the increased speed.

A percentage of groundwood is actually beneficial in facial tissue except for color which also prevents the more extensive use of unbleached sulphite. The makers of toilet tissue can learn a lot from the makers of facial tissue. A little more firmness and any facial tissue becomes the best of toilet tissue. Stock preparation is about the same.

The Roberts Grinder—A Radical Departure From Standard Wood Grinding Principles

R. M. RADSCH, Sales Manager
The Appleton Machine Co.

In 1936, F. W. Roberts of the F. W. Roberts Manufacturing Company, Lockport, New York, who had spent most of his life in the groundwood field, built a model grinder embodying the principle he dreamed about for many years. It proved astonishingly successful and in 1939 the first full size mill unit was put into operation in the mill of the Algonquin Paper Company at Ogdensburg, New York. It fully corroborated the results obtained with the experimental unit and after minor adjustments and alterations a uniformly high grade of pulp was produced at expected capacities. As a result, four more units were installed in 1941 replacing 12 pocket grinders.

In his paper on the Roberts Grinder before the Technical Association in February, 1941, A. E. Bartlett, chief engineer and production manager of the Algonquin Paper Company, concluded with the following remark: "The saving that is apparent in our mill where we make about 100 tons of groundwood per day is roughly about $50,000 a year. This is estimated from our tests to be the result of savings in power, labor, sawdust, repairs, auxiliary equipment, and auxiliary power."

The first experimental four-foot mill size unit was installed in 1940 in the mill of the Ontario Paper Company, Thorold, Ontario. It was operated as a two-foot grinder for about a year and subjected to every possible test. Ten additional Roberts Grinders were ordered as a result and together with the original unit were installed in line replacing 31 pocket grinders.

This grinder differs radically from all other types in principle and operation. Hydraulic pressure operated pockets are eliminated and it is designed for continuous grinding of wood. The grinder is rectangular in appearance, 13 ft. 0½ in. long, 12 ft. 8½ in. wide to motor coupling and 11 ft. 8½ in. high. A large cast iron ring 10 ft. in diameter is mounted inside of the heavy cast iron housing and slowly revolves in an eccentric circle around a pulpstone so that the ring almost contacts the stone at a point about 30 degrees beyond the perpendicular bottom center line of the ring. The stone surface and inner ring surface thus form a wedge or horn shaped space which holds the wood to be ground. The pulpwood within this space is drawn into the diminishing wedge chamber by the slowly rotating drum and thus forced against the stone at a predetermined pressure as it is being ground into pulp. A variable speed fluid drive unit coupled to a helical gear reducer and large worm gear unit mounted on the feed ring drives it and furnishes the required grinding pressure. This driving unit is mounted on the top of the cast iron casing which encloses the ring and stone. An automatic load control valve on the oil line regulates the power delivered by the fluid motor maintaining an even load on the motor

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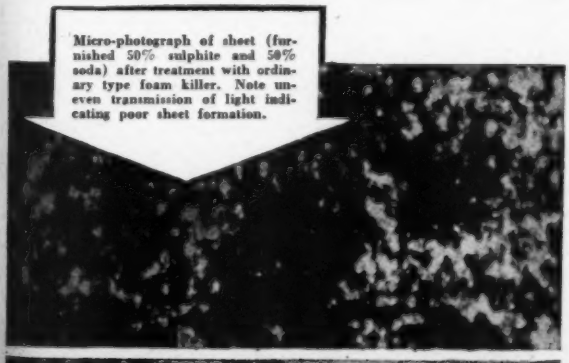
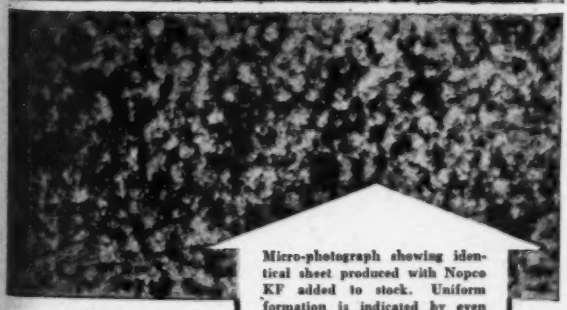


Micro-photograph of sheet (furnished 50% sulphite and 50% soda) after treatment with ordinary type foam killer. Note uneven transmission of light indicating poor sheet formation.



Micro-photograph showing identical sheet produced with Nopco KF added to stock. Uniform formation is indicated by even distribution of light and dark area.

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driving the pulpstone. This produces a driving mechanism with a constant torque and variable speed. The heavily constructed trueing lathe operated by an oil motor is mounted above the stone and consists of a cast iron cross head and slide mounted on two 5½ in. diameter brass covered rods. A fluid drive motor coupled to a stainless steel screw provides the power for moving the cross head across the face of the stone. A 4-way valve regulates the direction of travel, being adjustable for any desired speed. The lathe head carries through the back casing to make burr changing accessible. The lower part of the casing is designed to act as a stock pit. Pulp, when ground, is forced through large holes in the inner walls of the housing, forming with the outer frame wall the stock chamber. A controlling wire is mounted in the chamber for stock level regulation.

Present Roberts Grinder installations are using 54 in. x 54 in. stones, but larger diameters will be used as required in future installations. Artificial stones are used. Grinder shafts are 14 inches diameter at stone and flange mountings and bearings are lined with Ryertex and water lubricated. A shim catcher retains the small amount of shims passing between the stone and large feed ring. They are mainly ground up into pulp. The feed ring consists of two complete cast iron rings machined on the outside for the worm gear mounting. This ring is carried on a series of Ryertex blocks. These blocks act as both radial and thrust bearings for the ring. As the stone wears down slowly adjustment in the wood pocket is provided by moving the grinder case by means of a jack screw fastened to a cross member on the bottom castings and having a bearing on the base plate. Oil temperature control heat exchanger, temperature and load control units, etc., make up the complete self-contained grinder requiring no additional auxiliary equipment. The weight without stone is approximately 90,000 pounds. The floor space required for a grinder installation is but little greater than that used by a 3-pocket unit and the head room requirements are also about the same. As a result, few mill changes have to be made in substituting Roberts Grinders for the pocket type. Ordinarily three or four pocket grinders can be replaced by one Roberts, producing a comparable quantity of pulp.

The Roberts type of grinder has proven the practicability of high speed grinding. At a normal stone speed of 240 rpm up to 2,000 hp. per unit can be used. Increasing the speed to 330 rpm with its resultant greater surface speed permits the use of motor units up to 3,000 hp. At the higher speeds and greater power input corresponding increases in pulp capacity are obtained. Grinding pulp successfully at 5,000 feet per minute surface speeds has been fully demonstrated. This is also about the present speed limit, as it is the maximum at which artificial stones are guaranteed by the manufacturer.

The capacity of Roberts Grinders depends upon stone speed and power input. An early installation driven by 1,200 hp. motor at 240 rpm using a 54 in. x 54 in. stone produced 25 ton of good grade newsprint pulp in 24 hours at 50 hp. per ton. An installation using 3,000 hp. motor per unit 54 in. x 54 in. fairly fine grit size stones at 330 rpm is producing 38 ton air dry pulp in 24 hours at 68 hp. per ton, with a freeness of 103 cc. Canadian Standard. Due to power restrictions and other wartime limitations, it has not been possible to operate these grinders to their best advantage. Under proper conditions, we are convinced the Roberts Grinder using the right amount of power at 5,000 feet per minute stone surface speed will readily produce 45 to 50 ton of good news grade pulp in 24 hours.

With a correctly installed wood conveying system, one man can readily feed two grinders producing up to 100 ton in 24 hours. Reductions in grinder room crews of 50% and more can easily be made. Greatly improved operating conditions exist in a grinder room equipped with Roberts Grinders. The centralized compact unit requiring no auxiliary equipment makes for neat installations. Easily installed exhaust systems eliminate the escape of all steam and vapors into the room. The absence of any escaping pulp adds greatly in maintaining cleanliness. Wood conveying systems making the handling of wood and feeding it to the grinders entirely mechanical are a great help in maintaining good housekeeping. All this means that the grinder room can now be made one of the show places of the mill.

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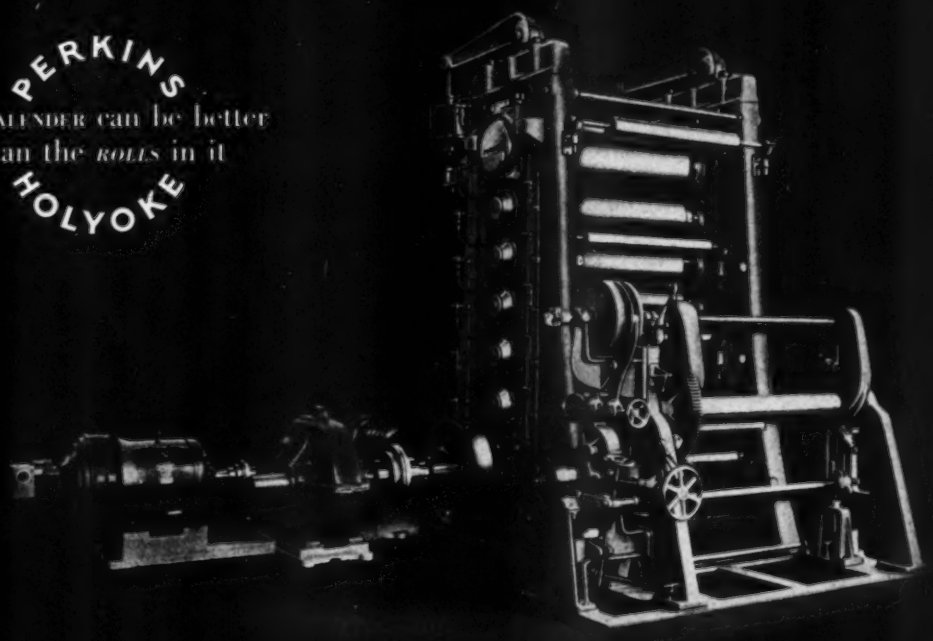

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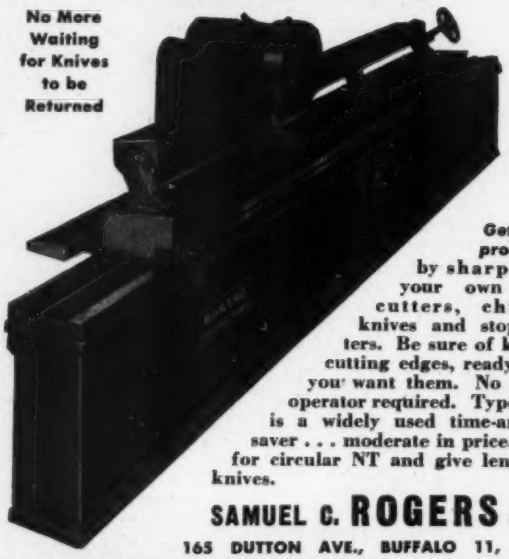

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This is the seventh installment of abridgments of papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, held in New York City, February 14-17, 1944. Succeeding issues of this magazine will contain further installments.

Reduce Pressroom Waste by Supplies Inspection

JACK BEIERWALTES, Sales Manager
E. J. Kelly Company

By setting up a supplies control system, the faulty supplies can be picked out before they spoil a job, lose a customer, or ruin a profit period.

The simplest, easiest and cheapest way to check inks is to *look* at them.

The drying of inks is caused by the vehicles absorbing oxygen from the air and probably to a certain extent of the molecules of the vehicle linking together to form larger but fewer molecules or polymerization.

The simplest way to check inks for drying is the tap-out. A light dab should be picked up on a clean second or third finger and tapped out on the sheet on which the ink will be printed. The ink should be tapped 20 times or so in one spot and then the finger while still tapping should slowly be moved away from the original spot until there ceases to be a transfer. This should produce an even gradation of varying thickness from one extremely heavy to practically no film at all. Of course the wider, but particularly the longer or the bigger the tap-out, the easier it will be to examine it.

The name, the number of the ink, and the time at which the tap-out was made should be marked on the piece of paper used and the paper then should be slipped into a stock pile. After the number of hours have elapsed in which the ink is expected to dry, the test sheet should be removed and a finger wiped across the tapped-out ink in two or three places to see how the ink in the different film thicknesses is drying. If it dries a little slowly (2 to 4 hours late), add up to perhaps a quarter of an ounce of a good cobalt drier to each pound of ink and thoroughly mix as the job goes to press. If the ink is from 10 to 12 hours slow in drying, perhaps up to a third of an ounce of a good cobalt drier and a quarter of an ounce of paste drier will correct it. These proportions will probably do the job or at least the ink will not cause any trouble.

If the tap-out doesn't dry in the portion where the film thickness approximates the one to be printed for two, three, or several days, it would probably be best to ask for a reshipment for that reason and return the ink.

As the drying of the different film thicknesses is checked, the drying time should be noted opposite the point where the test was made. When it is found necessary to add drier to the ink, the amounts and types of drier should be indicated immediately on the can before the information is forgotten, and the tap-out clipped to the job ticket for record.

If the ink is a fast or hard drying type, such as some heavy cover or bond inks, they sometimes cause trouble by drying too quickly on the press. Although it is practically impossible to predict how fast any ink will dry on the press, a rough idea can be obtained as to whether

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or not the ink might cause trouble by tapping it out on a clean polished piece of ¼-inch steel plate as was done on the paper. The plate should be kept from 5 degrees to 10 degrees warmer than the pressroom temperature by placing it near a steam pipe or radiator to more closely approximate conditions on a press which has been running.

Check for crystallization can be made in much the same way. First tap out the first down color and allow it to stand and dry the length of time it will probably be printed before the succeeding color will be printed over it. When that time has elapsed, the succeeding color can then be tapped out over the dried first film. When that time has elapsed, the succeeding color dries and binds on the first down color and can be checked. Any trouble can then be corrected before going to press, where delay is always expensive.

Chalking has the appearance of an undried ink where the color easily wipes off the sheet but the smear does not seem to be greasy. It will not smear and streak out like wet ink does.

Chalking is due to the ink not having as high a binding vehicle content as it should for a given sheet. The sheet will absorb too much of the vehicle and leave the unbound pigment laying up on the surface where it can be easily wiped off. Inasmuch as the paper can and will cause this as much or more often than the ink, the check to be at all conclusive must be made on the same stock on which the run will be made. The first tap-out drying check described would be used in checking for any tendency for the ink to chalk. If the color can be wiped off without the greasy smear evident in conventional nondrying, it would be wise to immediately mark on the cans of the ink checked that ½ to 1 ounce of No. 3 or No. 5 litho (linseed) varnish, and perhaps ¼ ounce of paste drier should be carefully mixed into each pound of the ink as it goes to press. Actually, slow drying and chalking often go hand in hand for if the ink fails to dry to a solid film, the whole vehicle continues to seep into the capillaries of the paper until so much is drained off the pigment that it is not properly bound to the sheet. Consequently if the ink actually is very slow in drying it may also chalk.

While the tap-out is the simplest, easiest, and quickest method for checking the ink with quite conclusive results, there are more definite means of checking ink for drying. Probably the best of them involves the use of a proof press.

This gives a series of proofs with varying amounts of ink. They will not only enable one to make some very conclusive drying checks, but can be used for checking many other properties of the inks as well. The name and number of the inks and the time at which the proofs were pulled should also be noted on each of them. Also, the proof number designating the order in which each proof was pulled—No. 1, No. 2, No. 3, etc., should be noted. The drying of the ink on these proofs can be checked in the same way the drying of the ink on the tap-outs was done. After all the work with them is completed, they can be filed in an envelope for further reference or fastened to the ink cans they were made with to give the pressman or whoever uses the ink an idea of what he might expect.

If the ink is too tacky, it picks the sheet, if nothing worse and if it isn't tacky enough, it fills in the wells of type and the screens of halftones.

Still today one of the best and most widely used methods of checking tack is the tap-out. To check an ink in this manner so that it will mean something definite, the ink to be checked must be tapped out on one finger while the next finger is tapping out a little of the same ink from an earlier order (from a standard can previously put aside for the purpose) which has produced known results. The tap-out should be made on the stock to be run and, if both inks pick, it's pretty fair evidence the stock is a little low in pick resistance. If the new ink picks, but not the old or standard, then the new ink is at fault and should either be corrected by the ink maker, or, if it isn't too bad, a little compound or reducing varnish added to the ink in the pressroom may be the simplest way of eliminating the trouble. If the new ink is less tacky, which it probably will be if it is just a few days old, it may not print as sharply if the difference is very great.

If there is a series of three or four

How to prevent inflation in one easy lesson

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We don't want inflation: we don't want another depression.

4 THINGS TO DO to keep prices down and help avoid another depression

1. *Don't* buy a thing you can do without.
2. *Never* pay more than the ceiling price. Always give stamps for rationed goods.
3. *Don't* take advantage of war conditions to fight for more money for yourself or goods you sell.
4. *Save.* Buy and hold all the War Bonds you can afford—to help pay for the war and insure your future. Keep up your insurance.

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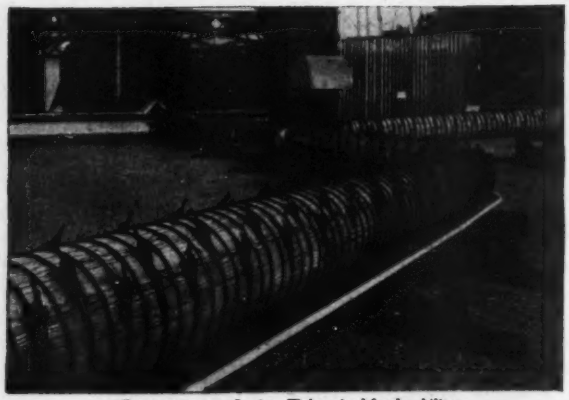

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Wauna, Oregon

to the Mill Supt.

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It can be done . . . and scores of mill superintendents have proved that a little experimenting with different type bars or a combination of types will often pay big dividends.

One example: The superintendent of a Wisconsin unit of a large chain of mills believed, with good reason, that he was not getting sufficient circulation in his beaters. At the suggestion of one of our beater engineers, he removed the straight commercial quality bars he had been using and put in alternate *custom-forged* SWW corrugated and SWW staggered bars.

This change in both quality and type of bars not only brought about the desired circulation increase, but also achieved a marked improvement in the quality of furnish. Indeed, results proved so gratifying that this entire chain of mills is now changing over to SWW *custom-forged* bars . . . straight, corrugated or staggered . . . or some combination of the three types, as individual conditions require.

If you have a beating problem . . . and who hasn't . . . why not talk it over with one of our men? It would involve no obligation on your part and may lead to the kind of production and profits you are daily striving for. Write today.

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inks to be printed, on a two-, three-, four- or five-color press, the tack of each succeeding color should be less than the preceding colors, in the order of their printing, to trap properly. The tackiness of the first down color should be as great as possible without picking the stock to be printed, and the tack of the last color should be great enough to transfer properly and no more.

The proof press, however, will show a lot more about the printability of an ink. To check for degree of printability, all checking must be done against a standard. This is relatively simple in the case of the inks used regularly. A 1- or a 5-pound can of each from a completely satisfactory order should be set aside as a standard and marked as such and its use in production forbidden. Then all checking can be done against a known standard and judged accordingly. A proof press can be also used to gain conclusive ideas about the trapping properties of two or more inks. Two or three plates can be inked up before pulling a proof, then a series of proofs pulled one on top of the other as quickly as possible by removing the plate bearing the first down color and quickly substituting the next, etc. The more rapidly this is done the more reliable the results.

With the proofs previously pulled for drying checks, inspections can be made to determine cleanness of print, sharpness of the type, and lack of fill in the deeper tones of the halftone.

No better way of checking an ink for shade can be found than by making comparisons between a series of dried proofs bearing a gradation of film thickness from a too-heavy-to-print film to one that doesn't cover. The shade of all inks changes at least a little in drying and also greatly by the thickness of the ink film. Therefore, in this series should be found a print which exactly matches the customer's color O. K.

Such a series of proofs also furnishes a pretty fair indication of the way in which an ink will lay. However, minute differences in impression and evenness of ink distribution are tremendous factors in this respect, and it, therefore, cannot be considered by any means an infallible check for mottle.

Offset is another source of trouble and it's possible, with a little experience and a simple little method to know what to expect from printing a given ink on a given sheet. This, of course, must be essentially a relative test to determine whether a new ink will offset more or less than a standard, or one sheet cause an ink to offset more than another.

This method involves drawing two inks down very loosely, leaving a heavy film of the recently received ink against a standard on the sheet to be printed and then observing which ink loses more quickly its glossy, greasy sheen. The one which becomes dull quicker is setting faster and should offset less. After the inks have set for a minute or two, each ink can be smeared out with as nearly the same pressure as possible and, if the pressure has been the same, the one which smears the least will probably be the least likely to offset.

The properties of printing plates are more evident and less abstract than those of paper and ink.

As with inks, however, a supply control system for printing plates can be set up as simple or extensive as the printer believes warranted by the size and type of his business.

The first step in checking plates is to look at them as they come in to make sure the proper plates are received, not those intended for someone else. Shipping clerks have been known to make errors due to inexperience, similarity in the names of two printing plants, or for any number of reasons. More careful examination and checking against the dummy or art work for the plate will show whether everything is in it that was wanted or whether something unwanted is present. Finding such errors, as the plates are received, normally will allow enough time for corrections before the job is ready for the press. This would eliminate the necessity for lifting the plate out of a locked up form and shutting down the press while the correction is being made.

A good portion of the plates sold today are flat and wood mounted. The effect of the changes in humidity and temperature on even the finest of oil treated blocks is well known. Those effects will probably become even more pronounced in the future, as supplies and transportation facilities dwindle and force the use of

lower grade blocks which will not hold shape so well. Even good wood block mounts will warp and twist and consequently rock on the bed of the press. A rocking plate is a common cause of slurs. A rocking cut can be easily detected by checking it on an idle press bed, a good flat glass plate, or whatever is handy and equally suitable. Both sides, the wood and the metal surfaces should be checked for smoothness.

Work-ups occur when the edges of a block, wood or otherwise, are not square, i.e., perfectly perpendicular to the press bed. A chip or a shaving under the edge of the block at the time it is sawed or trimmed might easily cause that. So, upon receiving printing plates it would be wise to check all block edges for squareness. A good cabinet maker's square should serve nicely and thus eliminate a troublesome springy form or incessant work-ups throughout a run.

It is not uncommon for a group of letters or other printing matter to be unusually lower or higher than the other matter on the printing surface of an electro or other plate. This type of flaw can be easily and quickly picked up by placing a straight edge in different directions across the surface of the plate and the flaw corrected before presstime.

Cuts may occasionally fail to print properly because of a flaw in etching or tooling; a good glass and an experienced eye can often spot unwanted shoulders on dots, type matter, rules, etc.

A plate can be quickly and easily checked for height. There are a number of good type gauges on the market, selling between one and five dollars. This type of gauge will check only the height of the edges of the plate, but that is usually where the trouble occurs.

For a more complete checking a couple of other instruments, more costly than those referred to, but not excessively so, are available. First, a good micrometer which will indicate the height of a plate and how much is to be done to it, if it is too high or too low. Better yet, a Hacker or similar type gauge, which can be used to read in the thousandths the exact height of any portion of any plate.

A depthometer can be used very successfully to determine depth of etching. With such an instrument the depths of plates can be measured as received and the readings checked against the depth standards for different types of plates as set up by the photoengraving and electrotype industry.

As in the case of inks and plates, paper should be checked the day it is received to see that no errors or troubles occurred in shipping and handling. Some one must open up the cases and look at the contents, particularly the smaller quantities, to make certain that a white enamel as ordered was received, instead of india, for example, or cover stock instead of bond, etc.

If the cases and skids are carefully opened, they can then be closed again in their moistureproof wraps to prevent their losing or taking on water on the edges of the pile and causing wrinkles, bellying in the center, etc., if only a one-color job is to be run. If two or more

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External vanes and oversized shroud of Morris pressure balanced impeller reduce wear.
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The Morris Type ST-P Stock Pump insures a steady, even delivery and is adaptable to the pumping of both clean and dirty stocks.

Morris Pumps are liberally powered to provide for moderate increases in consistency or capacity.

In replacing old-style plunger pumps, the Morris ST-P Stock Pump costs less than one-third as much, occupies less than one-tenth the floor space, one-quarter the head room, and is far more economical to operate and maintain because it has but one moving part.

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colors are to be printed, the paper should be "hung" or put in equilibrium with pressroom humidity.

The value of a complete air conditioning system for a printing plant can hardly be overestimated.

A frequent source of trouble with papers is due to the fact that the stock may not have been trimmed squarely; this factor can be checked simply by placing the opposite edges of the sheet together, without creasing, and comparing the lengths. Any differences in edge length will indicate that a certain amount of the stock is out of square.

Many times the grain direction of the stock is an important factor in the finished job or the way it runs. A good way to check grain direction is to crease the sheet hard along first one dimension, running the index finger along the crease, and then crease along the other dimension. The rougher feeling crease will be across the grain, and the smoother feeling crease will be with the grain.

If a sheet, particularly an uncoated one, is to be printed on one side only, the felt side should be used, being smoother.

A simple and generally used method for checking a sheet for smoothness, and thus in some measures the way it will print, is to lay a known sheet across part of it, pick both sheets up, roll up or fold and compare the type of glare it reflects.

Laying a sheet down and watching the way in which it tends to curl can also be helpful. Perhaps the sheet can be run in such a way as to take advantage of the curl if it's in one direction only—such as curling away from the impression cylinder to make stripping easier. Or, if an extremely heavy solid is to be printed, the penetrating of the ink will tend to straighten the curl rather than aggravate it, when only one side is to be printed.

Excess foam or bubbles on a paper or coating machine will cause pinholes in a sheet. Pinholes do not print halftones or solids properly. About the only way to precheck a load of stock for pinholes is to examine carefully several sheets selected at random from the shipment, using good glass with a fairly wide field, such as a linen tester. Such a glass could also be used for checking plates. A light placed so that it shines through the sheet or even above the sheet so that pinholes can be picked up from the differences in reflection, will also help considerably.

However, the most conclusive tests as to the printability of a sheet can only be made by a proof press as used in checking inks. A proof press properly used is superior to ink smear and wax tests, even in the hands of the best technicians.

Inks and paper are interdependent and should be checked together. In checking one sheet against another or against a standard, two strips each of the same caliber, and a little larger than half the size of the form are butted together on the cylinder and moved into the open grippers so that one gripper catches the two butted edges.

If a sheet is to be varnished after printing, the customer is entitled to a good varnished job, whether it be by press or spirit varnish. While there is a considerable difference in varnishes, the paper probably has an even greater effect than the varnish on the final result. The best varnish will leave much to be desired on a poor varnishing sheet, while a mediocre or poor varnish may look good on a good sheet. Paper made by the same formula and mill can, and often does, vary considerably from run to run, probably more in its absorption qualities than in any other respect. This factor cannot be judged by inspection so that paper should be proofed with varnish, either press or spirit, before it goes to press.

Paper also has considerable effect on the color of a varnish film. In general, the more absorbent sheets will make a varnish appear more yellow and less glossy. Varnish will appear clearer and glossier usually on harder sheets. But this isn't always the case, for color of the base stock, and transparency and oil wetting properties of the coating, have considerable bearing on varnish color. However, the appearance of varnish over a solid ink film is not affected much, if at all, by the paper.

Paper and inks are interdependent, and troubles apparently caused by one may actually be due to the other. The only way to know definitely which is responsible is by checking; prechecking as described can avoid much waste and trouble.

A good, interested pressroom foreman or superintendent can usually find time to check over his supplies and by these methods avoid much waste and extra work.

Diatomaceous Pigment in White Patent Coated Solid Manila Board

WILLIAM R. MONETTE, Engineer
Dicalite Company

The results reported in this paper were secured by the use of diatomaceous pigments in both the liner and the filler of white patent coated solid Manila board manufactured on a cylinder machine. These data were compiled from the mill's own laboratory records, kept on regular production runs, and give a clear and accurate picture of results secured. Co-operation of superintendents and machine operators have given an unusual opportunity for observation.

In order to compare results with and without the use of the diatomaceous pigments, records were kept on runs under both conditions. Also the furnish of both the liner and the filler stock was kept the same as nearly as possible. The liner furnish was made up of both long and short fiber stock; bleached sulphite pulp and a small percentage of hard whites. This liner stock was highly jordaned and considerably hydrated having a Schopper Riegler degree of beating of from 35 to 38. The filler furnish was made up of groundwood and unbleached pulp having a Schopper Riegler degree of beating of from 34 to 38. These ranges of degree of beating are constantly maintained in manufacturing this board.

The diatomaceous pigment in the proportion of approximately 5% on the weight of the pulp, was added to the beaters. Results were apparent from the beginning being noted and commented upon, particularly by the machine tenders.

The most important need was for greater bulk since to obtain the desired caliper, the use of additional pulp produced a board of heavier weight per thousand square feet than specified.

Another important problem was the frequent tendency of the stock to form high and low spots as the sheet was being formed. The high spots were excessive piles of fibers and were pressed too tightly without being dried sufficiently after passing through the dryers. The low spots were loosely formed which after passing the dryers were too thin and overdried. This condition tended to cause dark streaks on the surface of the board which also remained uneven in moisture content after passing the dryers.

Officials at this mill state definitely that the one advantage of increased bulk well justified the use of the diatomaceous pigment. While caliper increased from 0.017 to 0.0175 the weight in pounds per 1,000 square feet decreased from 74.0 to 73.5. Density (as pounds per point) dropped from 4.35 to 4.20. These figures are the average for the 9-hour period covered. Besides enabling the mill to secure desired caliper without increasing weight specifications, this bulking effect has meant a saving in expensive paper fibers which is particularly important today in view of wartime restrictions.

Improved sheet formation is a quality which cannot be expressed in test figures but can be observed by the expert eye. However, it can be substantiated by tests for density, bursting strength, stiffness, tear, etc. The addition of diatomaceous pigment to the furnish has solved the formation difficulties in this plant which were formerly evident in their finished sheets. Addition of the diatomaceous pigment tended to level out the sheet giving a smooth finish with an equal distribution of moisture across the entire width. This was definitely attributed to better and more even formation at the wet end.

It was observed that the diatomaceous pigment added to the furnish dispersed the fibers far more evenly than they ordinarily dispersed by themselves in the wet end during formation. Improved dispersion naturally allows the fibers to build up more uniformly on the cylinders, giving a more even sheet entering the dryers. Better formation, easier drying and improved finish are the results. The latter advantage is a substantial one, according to the mill's officials, showing up in better printability in converting operations. The surface accepts ink more readily and uniformly without the necessity of "flooding" solid areas of printing plates.

Whereas a steam pressure of 7 pounds was required to dry the sheets containing no diatomaceous pigment, the sheet containing 5% of this material required only

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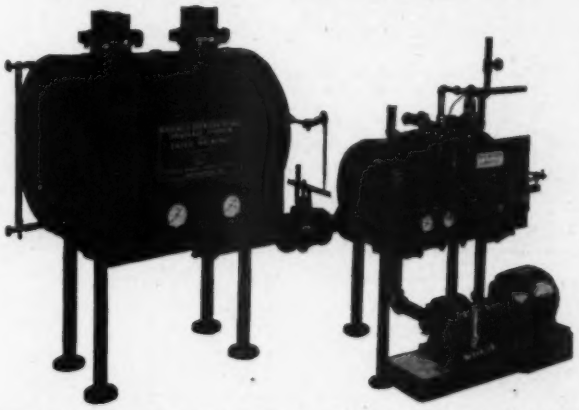

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● Important steam saving is possible with Stickle Differential Drainage and Control. Mills operating paper and board machines equipped with Stickle Drainage and Control report savings up to 1200 pounds of steam per ton of paper dried. Compilation of savings effected by a large number of installations, with maximum and minimum figures representing extremes of conditions to be encountered, show an average close to 20 per cent.

Stickle Differential Drainage and Control makes possible maximum temperatures with minimum steam consumption, resulting in high production efficiency. Besides affording a big saving in steam costs and eliminating waste of steam in production processes, it assures correct drainage of condensate and air, permits establishment and maintenance of desired moisture content, increases production and reduces quantity of sub-standard product.

*This is one of many advantages that has made Stickle Drainage and Control System the choice of the paper industry. Among other advantages the complete Stickle System affords are: Correct Drainage at all pressures; Stabilized Steam Flow; Close Control of Moisture Content; Uniform Drying; Visible Operation of each syphon; Improved Quality of product and Higher Production Capacity—increased speed of machines.

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an average of 4.3 pounds of steam pressure for drying. Such drop in steam pressure is regularly noted in this mill when diatomaceous pigments are used, in fact, the drop here recorded is less than average. In the majority of regular runs on this type of stock, the steam pressure drop has averaged more than 50%.

Experience has proved to officials of this mill that any stock which is difficult to dry can be dried much easier with the addition of approximately 5% diatomaceous pigment to the furnish. Superintendents and machine operators generally will realize the advantage of this point, for almost every board mill will at one time or another have types of stock that are hard to dry.

Stain Reaction of Unbleached and Bleached Groundwood Pulps

JOHN H. GRAFF, Research Associate
The Institute of Paper Chemistry

Preliminary investigations of unbleached and commercially peroxide-bleached groundwood pulps showed that no differentiation could be obtained with phloroglucinol, aniline sulphate, the iodine-iodide-metallic salt stains, the "W" stain, or Texchrome. The bright stain could not be used because previous investigations (Graff, John H., *Paper Trade J.* 113, No. 13:100-104, September 25, 1941) had shown that a relatively large number of unbleached groundwood fibers stain blue-red, red-blue, or red with this stain.

A study of the fluorescent reaction with ultraviolet light showed some interesting results; for example, sheets of various samples of unbleached groundwood pulps exhibited fluorescent colors varying from dark purple-drab to dark vinaceous-gray and a sample of bleached groundwood pulp gave a very light vinaceous-gray fluorescent color. However, in mixtures—particularly with other types of fibers or with very lightly bleached groundwood—this differentiation would be very uncertain.

Past experiences with the Loften-Merritt stain (Graff, John H. *A Color Atlas for Fiber Identification,* Appleton, Wis., The Institute of Paper Chemistry, 1940), however, suggested that this stain probably could be used for the microscopic differentiation of unbleached and bleached groundwoods.

The Loften-Merritt stain is prepared by mixing 10 parts of 2% Malachite green, 20 parts of 1% fuchsia, and 3 parts of 0.05 *N* HCl.

This stain gave the following color reactions: unbleached groundwood, deep blue-violet to pale violet; commercially peroxide-bleached groundwood, amethyst violet to light Hortense violet.

To determine the accuracy of the fiber differentiation, the following mixtures were used for fiber analyses: 1) 70% unbleached and 30% bleached groundwood; 2) 50% unbleached and 50% bleached groundwood; 3) 30% unbleached and 70% bleached groundwood.

These analyses showed a standard deviation entirely consistent with accurate fiber analysis and indicated that results can be obtained with a small percentage of error.

The pulps as originally received were dried and stored for 16 months, after which time the brightness of the unbleached sample was 59.2 and that of the commercially peroxide-bleached groundwood was 64.7. The fluorescent differentiation of handsheets from the pulps proved to be practically the same as when tested 16 months before, and the stain differentiation with the Loften-Merritt stain also was the same.

Acknowledgment—The results of this investigation are published through the courtesy of the St. Regis Paper Company.

A Study of Methods of Slime Control

JOHN W. APPLING, Research Associate
The Institute of Paper Chemistry

The Biological Control Committee of American Paper and Pulp Association at its regular meeting in February, 1943, approved the sending of a slime control questionnaire to representative paper and pulp mills in the United States. This study also was approved by The Institute of Paper Chemistry. Careful attention was given to the type of mill and to its geographical location. A total of 43 questionnaires was mailed during the months of June, July and August of 1943.

There was an excellent response to the questionnaire, 34 of the 43 questionnaires being returned.

In response to the query, "Do you have effective slime control in your mill?" 26 mills, or 76.5% of those reporting replied in the affirmative. The remaining mills had either ineffective control or only fairly effective control. Four of the latter group are obliged to shut down at times because of slime. In addition, four mills which reported effective slime control are obliged to shut down at times because of slime. Among the materials reported as slime removers Magnus Slimex occurred nine times, water under high pressure seven times, Oakite No. 22 two times, mechanical means three times, and miscellaneous nine times.

Effective slime control was being obtained by the use of one or more of the following disinfectants: chlorine, chlorine and ammonia (chloramine), Nalco 21, Nalco 23, Santobrite, Merfenel, Lignasan, copper sulphate. The dosages used vary from mill to mill, making a summary of them practically impossible.

Each of the eight different disinfectants was cited one, two, or three times as appearing to become ineffective with continued use, although initially it gave good slime control.

Every mill reported the presence of slime in one part or another of the mill system.

As to the prevalence of slime during certain seasons of the year, 24 mills stated that the slime was more prevalent during the summer, four during the spring, two during the fall, one during the winter, and four stated there was no seasonal variation. In a few cases the reply indicated prevalence at more than one season of the year.

With regard to the treatment of raw water, 18 of the mills used sedimentation and/or filtration, 23 used chlorine (with or without ammonia), whereas four reported no treatment being used for the fresh water. The chlorine residual obtained in the treated water varied between 0.1 and 0.5 ppm in 19 mills, from 0.6 to 1.0 ppm in five mills, and 1.5 ppm in one mill. These values are difficult to compare, because they were not taken at comparable points in the mill system. Some mills take the sample near the point where the chlorine is added, whereas others take the sample at the most remote point possible from that at which the chlorine is added.

Four mills recirculate less than 50% of the white water, 10 mills recirculate more than 50 but less than 75%, and 15 mills recirculate more than 75% of the white water.

The following number of pulp mills are represented in the returned questionnaires: nine sulphite mills, eight groundwood mills, six soda mills, five sulphate mills, four rag mills, and one semi-chemical pulp mill.

In a very general way, the distribution of paper and paperboard mills was as follows: 10 board mills, 10 book-paper mills, two newsprint mills, four tissue and towel mills, three wrapping-paper mills, and 10 writing-paper mills.

• A survey of your material handling operations may reveal methods for substantially reducing your plant overhead. The new Baker Catalog contains actual case histories of many companies who have accomplished this with Baker Trucks. A few of them are listed below.

★ ★ ★

Faced with the need for doubling his storage space a large publisher avoided adding warehouse rent to his overhead by installing a Baker Hy-Lift Truck. Tiering skid loads of paper stock multiplied the effectiveness of available floor space and on rental savings alone he paid for his truck in 18 months. (See illustration at left.)

The world's largest manufacturer of domestic ranges cut handling costs 75% and speeded plant production with a fleet of 8 Baker Trucks. On one operation, that of carrying steel sheets from shearing department to press room, costs were cut from 14¢ to 1.6¢ per ton. (See illustration at right.)

A leading producer of wall board for prefabricated homes found Baker Low-Lift Trucks ideal for handling large quantities of 8 x 14 ft. panels. Besides effecting substantial savings in handling costs, this company reduced overhead by conserving manpower and minimizing damage to material transported. (See illustration at left.)

Overhead costs for material handling are kept to a minimum in a large aircraft plant by using Baker Trucks for a wide variety of operations such as carrying cylinders, crankcases, and other heavy parts to assembly lines, carloading, unloading, etc. Illustration at right shows truck carrying service tanks of cutting oils to production departments for machining operations.

On the recommendations of a Baker Material Handling Engineer a warehouse installed a handling system using a Baker Fork Truck. Handling costs were reduced from 67¢ to 50¢ per ton—a saving of 25.4%. Overhead was thus reduced $153.00 per week or $7956.00 per year. (See illustration at left.)

A Baker Crane Truck made additional inside floor space available for production in the plant of a machine tool manufacturer, by storing large machine beds and other heavy castings in the factory yard. Increased production was thus achieved with a minimum increase in plant overhead. (See illustration at right.)

★ ★ ★

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Plant and production managers, traffic managers, superintendents, purchasing agents and any others concerned with material handling will find the new Baker Catalog No. 52 a valuable reference.

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Baker INDUSTRIAL TRUCKS

NEW EQUIPMENT AND SUPPLIES

Stabilized Traveling Platform

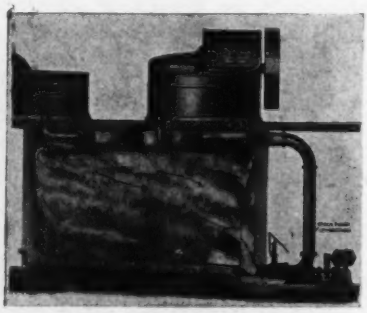
The Cleveland Tramrail Division, The Cleveland Crane & Engineering Co., Wickliffe, Ohio, has developed a new Stabilized Traveling Platform that can be raised or lowered without swing as firmly

as though held by vertical guides. It can be traveled to any point longtitudally or laterally in an area covered by the crane on which it is operated.

The unit illustrated is of the all-welded steel construction. It will carry a load of 3 tons and has a hoisting speed of 18 fpm. This type of platform is suitable for operation through a vertical height up to 30 ft. and may be furnished for operation at any hoisting speed from creeping to 50 fpm, or more.

Pulp Stock Agitator

A circulating system for pulp stock agitation in any horizontal or vertical stock chest has been announced by D. J. Murray Manufacturing Co., Wausau, Wis. In the accompanying illustration, the system is



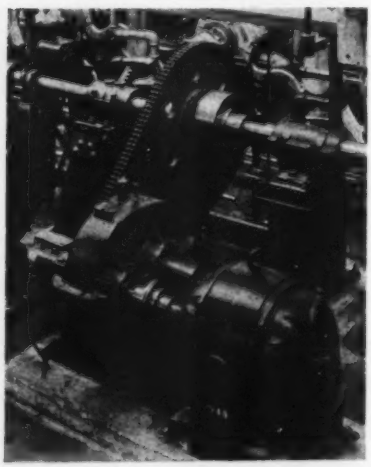
applied to a horizontal chest. The installation is arranged to withdraw the stock from one end of the chest and discharge it into the other end. The stock flow within the chest is in one direction.

According to the manufacturer, no special chest construction is required for use of the system—the system will efficiently agitate the stock in any size or shape of chest. Two features of the system, also pointed out by the manufacturers, are: baffle for directing the flow of pulp stock to areas where "dead" deposits of stock are apt to form in the chest, and method of introducing new pulp stock into flow tube that quickly mixes it with stock already in chest.

Patented in the United States and Canada, the system is designated as the *Murray Pulp Stock Agitator.*

Helper Drive for Paper Machines

Rice Barton Corporation, Worcester 1, Massachusetts, has announced a helper drive for application to almost any type of paper machine drive. The drive, according to the announcement, is particularly useful on parts of the paper machine which require slow speed operation from time to time, or which are exceedingly difficult to start from rest due to high break away loads. (Dryer parts and calenders are



usually the most difficult parts of a machine to start, and dryers occasionally require slow speed operation for removal of broke, or for sewing felts.)

The motive force for the helper drive is supplied by a small electric motor. The horsepower of the motor depends upon the characteristics of the machine. Ordinarily it will be between 10 and 30 hp.

A geared speed reducer is used to multiply the torque and reduce the speed. The output end of the reducer is connected to the shaft of the machine through an overrunning clutch. Connection between reducer and clutch may be direct or a chain drive.

The machine is started by starting the helper drive motor with the main driving clutch disengaged. This procedure not only starts the machine but also runs it up to a speed of approximately 50 fpm. The machine may be operated at this speed as long as necessary.

When it is desired to run the machine at full speed, the main clutch is engaged. This engagement increases the speed of the half of the over-running clutch attached to the shaft, but it does not increase the speed of the other half.

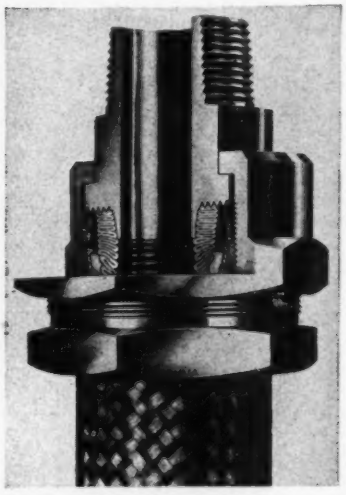
A small centrifugal switch shuts off the helper drive motor before the top speed of the machine is attained. Therefore, the over-running clutch idles on the shaft during normal operation.

By disengaging the clutch and starting the helper motor, the speed of the machine is reduced to that of the helper drive. Usually a mechanical interlock is provided so that the main clutch cannot be engaged unless the helper drive is running.

According to the manufacturer, this helper drive reduces necessary maintenance of the main clutch as well as improves its operation.

Detachable Coupling for Flexible Metal Hose

A detachable brass coupling for helical flexible metal hose in sizes from ¾ in. to 1½ in. in I.D. has been developed by Packless Metal Products Corp., New Rochelle, N. Y. The unit consists of four parts—the nut, back, stem and split ring. When assembled, the convolutions of hose and the metal braid are held by pressure between the members of the coupling as illustrated in the accompanying cut-away view. Likewise, a self-contained union



permits the pipe thread end of the coupling to be screwed directly into the machine fitting and the union tightened without twisting the hose.

The coupling withstands pressure tests of up to 800 pounds.

Four Centralized Lubricating Systems

Alemite Industrial Lubrication Division, Stewart-Warner Corporation, 1828 West Diversey Ave., Chicago, has announced four centralized lubricating systems: namely; Alemite Lubro Meter, Alemite Dual Progressive System, Alemite Progressive System, and Alemite Dual Manifold System.

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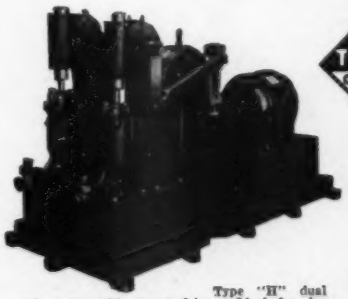

Type "H" dual unit pump with motor drive. Ideal for dye injections, boiler treatment applications, caustic and acid proportioning, and other services. Built in 34 sizes with a capacity range of 6.50 to 223.8 G.P.H. at pressures from 200 to 5500 p.s.i.

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The Alemite Lubro Meter satisfactorily handles both oil and grease. It can be used over a wide range of temperatures, and may be serviced from hand or power operated portable type guns. It also is available as a fully automatic system.

The lubrication is accomplished through individual valves at each bearing connected to a single lubricant supply line. The valves supply each bearing with an adjustable predetermined amount of lubricant.

The Alemite Dual Progressive System provides for the positive delivery of a predetermined amount of lubricant through a single pipe line to each of a number of bearings, and is provided with an indicator which signals the operator when the lubrication cycle is completed. Each bearing is fully lubricated before the next in line is serviced.

Lubricant under pressure may be introduced to the system by either portable or stationary hand guns or power driven pumps. The system will function efficiently under extreme heat or cold.

The Alemite Progressive System is the original Alemite Progressive System incorporating new design and manufacturing features. It is a method of centralized grease lubrication, which will lubricate from 3 to 20 bearings feeding each in turn with a predetermined amount of lubricant.

This multiple line system may be mounted on a machine in any convenient location and tubing run from each of the outlets conducts the lubricant to its respective bearing. The system may be serviced from hand or power operated portable grease guns.

The Alemite Dual Manifold System is a dual line system of centralized lubrication, designed for high pressure grease or oil lubrication that can be applied to any number of bearings on one machine or a battery of machines. It is a direct hydraulic system by which a fully adjustable predetermined charge of any type of grease or oil at any temperature may be introduced into all bearings of a machine or of a battery of machines.

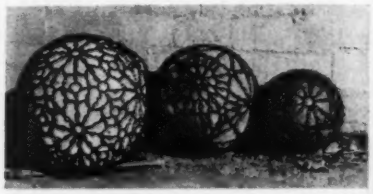
Centrifugal Pump with Motor Mounted Overhead

American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill., has announced a centrifugal pump

with the motor mounted overhead. Among the advantages for the design, cited in the announcement, are: motor more accessible; motor protected against flooding; and arrangement requires less floor space for installation. The manufacturer's Type "A" and Type "T" pumps, both horizontal, are available with this motor mounting. Illustration shows a 5-in. Type "T" pump (left) and a 2 in. Type "A" pump (right).

Pipe Line Cleaner

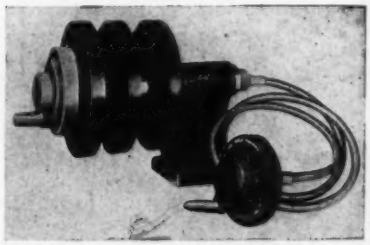
Corona Sheet Metal Works, Corona, Calif., has announced a device for cleaning pipe lines. This device, known as the *Rotary Pipe Crawler,* consists of a ball, either pneumatic or solid core, covered with a net-like arrangement of chain. The ball is made of rubber or of synthetic material in sizes from 2 in. to 36 in. in diameter.



The ball, selected as to size for the pipe being cleaned, is entered into the line through a suitable fitting. Flow in the line forces the ball to roll forward, thus causing it to remove the accumulation from within the pipe. With the pneumatic ball, direction of rotation may be reversed by partially filling it with water rather than inflating it with air.

Variable Speed Transmission

A variable speed transmission, featuring remote control and designated as the Speed-Jack has been developed for drives

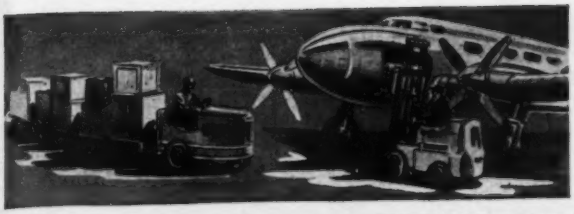


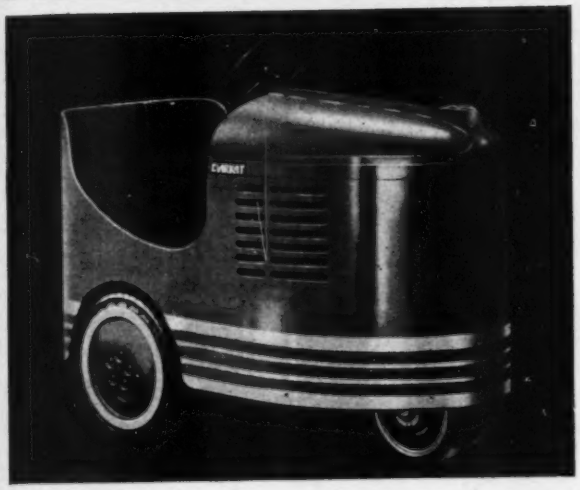
up to one hp., by The American Pulley Company, 4200 Wissahickon Avenue, Philadelphia 29, Pa. Remote control is through a flexible shaft, thus making it possible to mount the unit anywhere in or on a machine and to place the control in a location handy to the operator. V-belts provide stepless control of speed through a 3 to 1 ratio. Mechanical control of the flanges, which are of plastic with steel facing, permits the unit to be mounted either vertically, horizontally, or in any other position suitable to the equipment.

Non-Slip Floor and Deck Covering

A non-slip, plastic material designated as *Saf-T-Dek,* has been announced by Truscon Laboratories, Caniff & G. T. R. R., Detroit 11, Mich. Applied with a trowel to a thickness of about 1/32 in., it sticks to wood, steel, concrete or masonry (even to glass). On drying, it imparts a non-slip walking or working area even when wet or covered with oil.

Saf-T-Dek is available in two standard colors—tile red and concrete gray. It also is available in a spark-proof type for use where non-sparking floors are considered necessary.





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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Origin of the Physical Strength of Paper

Klemm's views that the strength of paper results from fiber felting are contrasted with those of the present author who proposes the following rather unusual explanation. The surface of the "adhesive substance" (which is an essential component) contains hydroxyl groups that bind large numbers of water molecules. These are in the form of what the author terms "water clouds."

When the sheet is pressed, the excess of water is removed in an amount about twice that of the water clouds. In the subsequent drying, more water is removed by evaporation and the adhesive material and the fibers are drawn together until the clouds diffuse into each other. Further drying vaporizes the clouds so completely that the surfaces are brought into very close contact and the hydroxyl groups of the components are bonded. In order to obtain a strong paper, the lignin content must be relatively low and the hemicellulose content high, so that on beating the maximum of the adhesive material is liberated. The degree of beating must be kept within definite limits. A suitable breaking length may be expected in paper that contains 35-40% undamaged fibers provided these are more than 1.5 mm. in length. (The original of this article is in Dutch and is not available.) E. L. Ritman. Polytech. Weekblad 36,340-2 (1942); through C. A. 38, No. 9, 2205 (1944).

Testing Containers for Transmission of Water Vapor

Recent trends in the measurement of water vapor transmission in evaluating containers used in packaging hygroscopic materials are given. Laboratory permeability tests show the relative permeability under ideal conditions but do not offer definite proof that containers actually fabricated from such materials will be adequate. For example, the fabrication process may involve bending, stretching, sewing, gluing all of which may have effects not indicated by the laboratory tests on the "impermeable" material. Transportation and handling, storage, variations in temperature and humidity may all cause effects that are not comparable with those found in the testing laboratory. The final tests should therefor be made with the actual product packed in the standard fabricated container, and every effort should be made to similate the abuses found in handling and in transportation.

Accelerated moisture-vapor permeability tests may be made by carrying out tests on the filled and mishandled containers in a chamber at 95% relative humidity and 100 Fahr. (avoiding condensation on the containers). Interval weighing of the containers gives an indication of the rate of water-vapor transmission. The product within the containers should be tested before packaging and also at the end of the tests. The maximum amount of water which a product (that is to be packaged) can absorb, and still be acceptable, should also be determined. Using such data, estimates may be made of the time periods during which a container offers satisfactory protection under varying climatic conditions. Richard W. Lahey. Chem. Eng. News 22, No. 8, 636 (April 25, 1944).

Writing on Paper with Various Inks, Laboratory Tests

This is a very comprehensive study of the effects of various types of sizing agents, the degree of sizing, and the composition of various papers on the bleeding and ink penetration (as well as darkening or fading) qualities of various inks. Prior to the war in Germany, 85% of inks manufactured for writing purposes were iron gallates (*I*), 12% contained synthetic dyes (*II*) and 3% were made from logwood extract (*III*). To inks of type I, manufacturers also added small amounts of dyestuffs to deepen the original color, and HCl, H_2SO_4, or oxalic acid to prevent the premature formation of iron gallate. Inks of class II, although frequently red, green, or violet, now due to tannin shortages, also include fast black and blue dyes. In their experiments, the authors used 7 inks of type I, 6 of type II, and 2 of type III. Those of type I had a *p*H range of 1.0—1.5. The *p*H of the III samples were 2.4 and 6.3. Inks of class II showed the widest *p*H range, namely, 3.9—9.7, indicating that some were distinctly acid and others strongly alkaline.

In most of the experiments test sheets (80 grams per square meter) were made on a Rapid-Köthen sheet machine from a bleached sulphite, beaten to 50 S.R., and treated in each case with four different sizing agents (rosin, montan wax, and two synthetic sizes). The amounts of each individual were also varied so as to give four different degrees of sizing. Thus 16 different types of laboratory sheets were prepared and subjected to inking tests.

Besides these laboratory sheets, 21 commercial papers and boards were tested. These included high grade rag, typewriter, and bond writing papers, index cards, chromo and wall paper, etc. The range in weight/m^2 was 50—250g/m^2; thickness, 0.053—0.246 millimeters; ash content, 0.5—30.0%. The ink penetration ("strike-through") tests were carried out with photoelectrically-controlled equipment (cf. Brecht and Liebert, Papier-Fabr. (1941), Nos. 15-16;97). The bleeding (or ink-running) test was correlated with absorptivity measurements (cf. above reference), after a series of attempts to measure magnified, inked-in lines had been found to be impractical. The darkening (or fading) of the inks after their application was measured by the authors by using a brightness tester and by measuring the "brightness" of the penstrokes (with lines inked 0.8 mm. apart, on a circular sheet of 6 cm. diameter), 1, 10, and 100 hours after they were made. The authors have developed a mathematical expression for computing the "brightness" of the various inks.

On the basis of these three tests (i.e., penetration, bleeding, and change in brightness), the authors conclude that, despite the wide variations in the behavior of the inks (some of which depended on the paper used), certain generalizations may be made. All inks of type I showed marked darkening after being applied. Inks of type III, and certain inks of type II also darkened, but far less than did I. However, three inks of type II actually grew lighter after application to paper. All inks reached their maximum (or minimum) color intensity within 24 hours after their application. The authors found that two inks which behave differently in the presence of a specific sizing agent show similar differences when the sheets are sized with another agent. For a specific sheet, 6 out of the 7 inks of type I showed less strike-through and bleeding than did those of type II. When strike-through was apparent in the case of an ink of class II, there was also serious danger of ink running.

In general, inks showing a high *p*H proved less satisfactory than those with a low *p*H. The viscosities of the inks played no major role. These inks of type I, which showed but minor differences in bleed or strike-through, behaved quite similarly, irrespective of the composition of the paper samples to which they were applied. Inks of type II, however, showed marked variations. For example, the red inks showed but little tendency to bleed or penetrate on papers free from groundwood, but manifested these tendencies markedly when groundwood was present. Of the various inks examined, one termed "Pelican-Scheck" (an ink of type II, *p*H 9.3) was the most "aggressive" (with regard to strike-through and bleeding). The mildest ink was a fast black experimental sample prepared by J. G. Farbenindustrie A.G.

For comparative purposes (where very different paper samples were to be tested) it was found expedient to use one specific ink (of Type I). For details, the original article, with its 25 graphs must be consulted. W. Brecht and E. Liebert. Papier-Fabr. Wochbl. Papierfabr. (1943) No. 8, 289-298.

Air-permeability and Errors in Its Determination

The author points out that the use of the Schopper instrument which, in Germany, ordinarily carries a celluloid ring to hold the sample into place, permits leaks and the passage of "false air" due to lack of tightness in holding of the paper, when the latter has a rough surface. The advantages of rubber packing rings are also briefly discussed. K. Agahd. Papier-Fabr. Wochbl. Papierfabr. (1943) 172.

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PAPERMAKING PATENTS

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Drive for Paper Manufacturing Machines

Patent No. 2,323,168. Alfred Vanden Bergh, Green Bay, Wis. Application March 14, 1941. Serial No. 383,433. 6 Claims. (Cl. 74—26). 1. A drive mechanism comprising a drive shaft, a frame structure through which the drive shaft operates, bearing means for the drive shaft and mounted on the frame, an eccentric on the drive shaft within the frame, an endwise movable rod, an operative connection between the eccentric and said rod, a guide bar carried by said rod, said frame having guide grooves therein for receiving the ends of the guide bar, cushioning means for the guide bar, a bridge member at the upper portion of the frame, said rod being slidable through the bridge member.

Process for the Preparation of Paper Stock

Patent No. 2,331,455. Edwin Cowles, Hopewell, N. J., assignor to The Cowles Company, Princeton, N. J., a corporation of New Jersey. Application June 9, 1937. Serial No. 147,211. 3 Claims. (Cl. 92—20). 1. Process for the treatment of waste paper containing both light and heavy trash for the preparation of paper stock which comprises partially defibering the waste paper to form a pulpy mass, withdrawing a major portion of said mass directly in the form of substantially clean defibered material leaving a single residue of relatively small volume containing a mixture of partially defibered material, and both light and heavy trash, removing both light and heavy trash from said residue, and recycling the remainder of partially defibered material for the separation of additional defibered material.

Pulp Consistency Testing Apparatus

Patent No. 2,346,945. Edward W. Samson and Alfred H. Croup, Erie, Pa., assignors to Hammermill Paper Company, Erie, Pa., a corporation of Pennsylvania. Application September 16, 1941, Serial No. 411,056. 1 Claim. (Cl. 73—51).

An apparatus for quickly and accurately measuring the consistency of a sample of pulp introduced therein, which comprises a cylinder open at the top, a perforated closure member across the bottom of the cylinder, a weighted piston that fits loosely into the cylinder, having at its lower end a sealing member in the form of a flexible, elastic, relatively thin projecting disc-like membrane attached in a horizontal plane around the bottom of the piston, with outside diameter slightly larger than that of the cylinder, and enough free space surrounding it to allow it considerable flexibility in the region between its attachment to the piston and its contact with the cylinder, when inserted therein, thereby sealing against the escape of fibers while still maintaining uniform friction against the cylinder wall throughout the motion of the piston, and having also at the lower end of the piston a perforated plate or screen so disposed and connected to egress channels in the piston as to facilitate the early escape of air from under the piston up through the clearance provided between the walls of the cylinder and the piston.

Low Electrical Resistance Paper and Method of Making Same

Patent No. 2,328,198. Franklyn E. Davenport, David C. Knowlton, and Robert W. McCormick, Watertown, N. Y., assignors to Knowlton Bros., a corporation of New York. No drawing. Application April 12, 1939. Serial No. 267,468. 18 Claims. (Cl. 92—21). 1. A paper of low resistance to electricity formed from a furnish stock composed of refined fibrous material and finely divided electrical conductive material of the first class intimately commingled in proportions, by weight, of approximately six and two-thirds times as much refined fibrous material as conductive material and compressed more highly and given more finish than obtained by a machine calender to render said paper highly conductive to electricity.

Beater Roll

Patent No. 2,324,845. Dwight E. Jones, Pittsfield, Mass., assignor to E. D. Jones & Sons Company, Pittsfield, Mass., a corporation of Massachusetts. Application January 22, 1941. Serial No. 375,386. 6 Claims. (Cl. 92—22). 3. A beater roll of the class described comprising in combination, an elongated cylindrical unitary roll body having rings secured thereto in spaced relation longitudinally thereof provided with circumferentially spaced aligned slots, cutter bars extending longitudinally and disposed in each of said slots, members extending between and into adjacent bars of a pair thereof and adjacent said rings provided with radially disposed openings, bushings threadedly engaging said body below said openings provided with threaded openings, and cap screws extending though the openings in said members threadedly engaging the openings in said bushings.

Paper Machine

Patent No. 2,330,891. Lloyd Hornbostel, Beloit, Wis., assignor to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin. Application November 13, 1940. Serial No. 365,468. 4 Claims. (Cl. 34—121). 4. The combination in paper machine of a water removing section arranged for free access to the front thereof for feeding the paper, removing the rolls, and for free ventilation comprising spaced lower rolls, spaced upper rolls spaced vertically from said lower rolls, trunnions disposed on the ends of said rolls, means for supporting the rear ends of said rolls, and means for supporting the front ends of said rolls comprising an upstanding lower frame section extending along the front side of the machine, supporting members extending upwardly from said frame section and supporting the trunnions of said lower rolls in spaced relation to said frame section, a plurality of columns spaced from said frame section in a plane parallel therewith a distance sufficient to permit the passage of an operator between said frame section and the columns, an elevated frame structure fixedly disposed on said columns in a plane spaced above said lower frame section a distance greater than the diameter of said rolls for the removal of said rolls endwise between said frames, and depending supporting members on said elevated frame structure for operatively supporting the trunnions at the front end of said upper rolls to provide unobstructed space at the front ends of said rolls for the circulation of air and for access to the space between said rolls from the front of the machine.

Method of Making Coated Paper

Patent No. 2,346,812. Donald B. Bradner, Mount Healthy, Ohio, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio, a corporation of Ohio. No Drawing. Application August 2, 1940, Serial No. 350,129. 7 Claims. (Cl. 117—65).

1. Process of making coated paper having a cast surface which comprises applying an aqueous coating composition comprising a solution of protein adhesive, ammonia and a compound of a metal taken from the class of zinc, copper and cadmium, to a web of paper, contacting the coated side of the paper against a casting surface while the coating is still wet, drying the coating while in contact therewith and driving out ammonia while the paper is in contact therewith.

Washing of Paper Pulp and the Like

Patent No. 2,347,504. William Henry Porritt, Chilcompton, near Bath, England, assignor to Becker Partington & Company Limited, London, England, a British company. Application September 11, 1941, Serial No. 410,358. In Great Britain September 12, 1940. 8 Claims. (Cl. 68—55).

1. Pulp washing apparatus comprising in combination a stationary outer vessel, an inner screening vessel coaxially therewith, an annular space for the pulp charge between said vessels, rotary agitating means arranged in proximity to and circumferentially about said screening vessel, means for drawing off washing liquid from the space within said inner screening vessel and means for introducing washing liquids into said pulp charge from a plurality of juxtaposed points transversely to the pulp column substantially as set forth.

BRANDON DRYER FELTS

Manufactured from the raw cotton to the finished felt

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TRI-UMPH all cotton, 3 ply 53 oz., widths up to 250".

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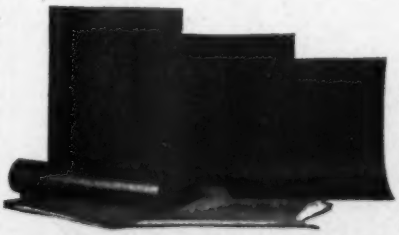

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GARLOCK

New Catalogues and Publications

American Maize-Products Company, National Starch Products, Incorporated, and Stein-Hall, Incorporated, New York 16, N. Y.—Copies of a 16-page multicolored booklet describing the physical and chemical properties of a new domestic starch, "Amioca" can be obtained by addressing the Technical Departments of any of the three companies named above. The booklet contains photographs, charts, photomicrographs and tables of comparison.

The American Pulley Company, 4200 Wissahickon Avenue, Philadelphia 29, Pa.—Just published are three new catalogues on their equipment. Catalogue HT-44 describes the American Hi-Torque Motor Pulley and also contains dimensions and list prices of standard sizes and complete price information for made-to-order pulleys. Catalogue FBD-44 gives complete information on pulleys, bushings and other equipment for short-center flat-belt drives. It also discusses the application, design and advantages of group drives. Bulletin SJ-44 points out the exclusive features of the Speed-Jack Variable Transmission and provides specifications and installation data.

Bowser, Incorporated, Fort Wayne 5, Ind.—Free copies of a booklet intended to acquaint industry with efficient equipment for liquid storage handling and dispensing may be had from this company.

Bristol Company, Waterbury 91, Conn.—Just issued by this company is Bulletin DM009, describing their free-vane electronic controllers. The bulletin contains photos and charts.

Chain Belt Company, 1600 West Spruce Street, Milwaukee 4, Wisconsin—A new catalogue, Bulletin No. 447, descriptive of Rex Speed Prime Pumps may be had from this company. It is well illustrated and contains tables and general information valuable to pump purchasers.

Clark Tructractor Division of Clark Equipment Company, Battle Creek, Michigan—A handy vest pocket catalogue issued by this company on its industrial haulage vehicles shows the many uses to which these vehicles can be adapted. It also contains a list of branch offices.

Cyclone Fence Division, United States Steel & Wire Company, Waukegan, Ill.—Prospective users of metal conveyor belts may obtain Catalogue No. 3, which has just been released by this company. Actual size illustrations, information on measurements, and a list of applications are included in this helpful pamphlet.

Hercules Powder Company, Wilmington, Del.—Intended as an aid to manufacturers already using nitrocellulose, as well as to those interested in possible applications of this material, a basic textbook on the properties and uses of soluble nitrocellulose has been published by this company's Cellulose Products Department. In addition to a history of nitrocellulose, the first section contains material on the manufacture, types, solubility, viscosity and other data. The second section discusses the application of nitrocellulose in lacquers, coated textiles, plastics, adhesives and inks. There are also numerous tables, charts and graphs throughout the book.

Wm. F. Klemp Company, 6601 South Melvina Avenue, Chicago 38, Ill.—Complete, up-to-the-minute information on open steel grating and stair treads is given in a book just issued by this company, which specializes in steel flooring. A valuable addition to the files of engineering and construction departments, the book, in colors, is profusely illustrated with photographs of the products in actual plant and building uses. Full installation data is given for every requirement.

Lincoln Electric Company, Cleveland, Ohio—To assist users of arc welding in establishing proper welding procedures and procedure control, a 48-page manual has been brought out by this company, which may be had without charge by requesting Bulletin No. 440. Complete coverage of the subject of "Fleet-Welding" is made in the booklet. In addition to the 29 photographs and drawings illustrating technique, the bulletin carries procedure tables.

Mercury Manufacturing Company, Chicago 9, Ill.—A valuable source of information on materials handling problems is the new Mercury Catalogue No. 7-11. Attractively designed and printed in four colors, this 40-page booklet contains, in addition to complete description and specifications on all Mercury equipment, brief treatises on the application and advantages of tractors and trailers, platform trucks, fork lift trucks and the "Fork-Truck-Trackless Train" System. Also included is a reproduction of W. P. B. regulations governing the purchase of industrial trucks and tractors, as well as reproductions of forms to be filed. Address the Mercury Manufacturing Company at 4102 South Halsted Street, Chicago 9, Ill.

Metallizing Company of America, 1330 W. Congress Street, Chicago 7, Ill.—This company has just issued a well illustrated metallizing equipment catalogue and price list.

Preferred Utilities Manufacturing Corporation, 1860 Broadway, New York 23, N. Y.—Just issued is a 2-page bulletin, No. 925, describing this company's protective coatings for use in protection of refractories, metals, ceramics, etc.

J. O. Ross Engineering Corporation, 350 Madison Avenue, New York 17, N. Y.—Just published by this company is a new bulletin, No. 205, describing the Ross Air Scrubber. The booklet explains how the Ross air washer can be used not only for cleaning the air, but also humidifying, cooling and fume elimination. The washer can also be used to heat white water or fresh water without the need for steam, and a schematic layout for such water heating is included. Copies may be obtained from the New York office or branch offices at 201 N. Wells St., Chicago 6, or 12953 Greeley Ave., Detroit 3, Mich.

Books

Chemical Formulary (Cumulative Index for Vols. 1, 2, 3, 4, 5 and 6)—Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y., this comprehensive index covers all the formulae included in the six volumes of *The Chemical Formulary.* The material has been arranged to facilitate quick reference. Cross references lead the user to all subjects relating to formulae or processes of interest. The volume contains 164 pages and is priced at $4.00 a copy.

Engineering Papers (Fourth Annual Contest)—Published by the Hydraulic Institute, 90 West Street, New York 6, N. Y., this paper-covered volume presents five papers submitted by employees of members of the Hydraulic Institute for the fourth annual engineering essay contest. The titles of the papers with names of authors and company affiliations follow:

Special Operating Conditions of Centrifugal Pumps, by A. J. Stepanoff, development engineer, Ingersoll-Rand Company.

A Common Language for Hydraulic Engineers, by Chas. J. Tullo, chief draftsman, Centrifugal Pump Engineering Division, Worthington Pump and Machinery Corporation.

Critical Speed, by Alexander Brkich, engineer, Cameron Engineering Department, Ingersoll-Rand Company.

Direct Acting Steam Pumps (Suggestions to make present pumping equipment meet wartime production requirements), by Darwin F. Schaub, application engineer, Worthington Pump and Machinery Corporation.

Effect of Entrained or Dissolved Gas on Rotary Pump Performance, by Morgan B. Sennet, engineer, IMO Pump Department, DeLaval Steam Turbine Company. The price of the publication is $1.50 per copy, plus postage.

Paper Trade Terms—Compiled by William Bond Wheelwright and published previously in pocket size edition, this work of approximately 50 pages, is a library edition of the same compilation. The book is bound in a stiff, blue cloth cover. The title and author's name is printed upon the front cover in gold. The first term to be explained is absorbent; the last, zone test. The price of the library edition is $1.50 a copy; the publisher, The Callaway Associates, Inc., 210 South Street, Boston, Mass.

Seamless Tube Data Book—This looseleaf book contains more than 300 pages of information on steel tubing. Divided into four principal sections with guide index and glossary, the work opens with a section of general data covering the history, manufacture, tests, etc., of the steel tubing industry. The other sections in order of presentation are: mechanical tubing, pressure tubing, and reference data.

The section on mechanical tubing supplies information on typical uses. It suggests how to obtain best results with tubing. It also includes data on properties of beams, elements of sections, torsion columns, properties of round tubes and solid bars and other related information.

The section on pressure tubing covers various pressure formulae, specifications and tolerance tables for boiler tubes, heat exchanger and condenser tubing, still tubes, alloy steel pipe, stainless steel analyses, with metallurgical data.

The reference table section includes numerous formulae; weight tables for rounds, squares, rectangles, surface areas both inside and outside; and other tables commonly found useful in tubing applications.

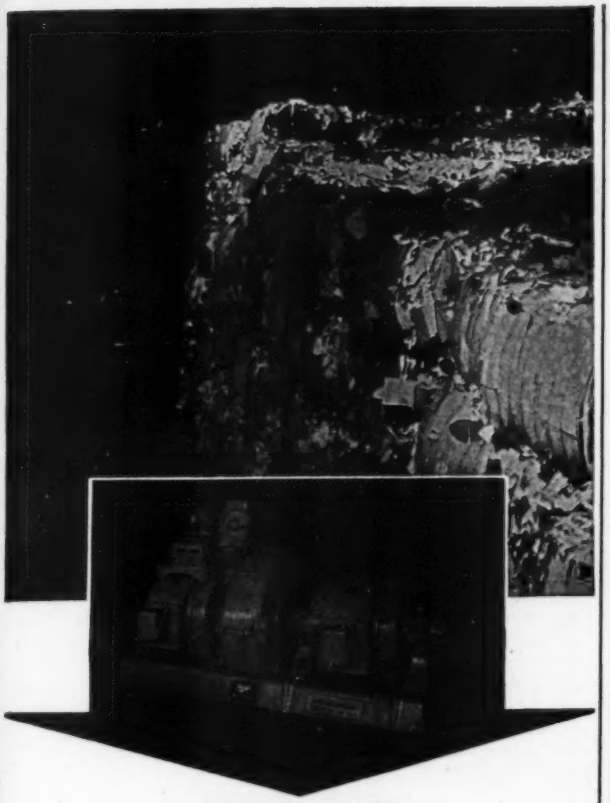
The book, published by the Seamless Steel Tube Institute, Pittsburgh 19, Pa., is priced at $2.50 a copy.

Terminal Markings for Electrical Apparatus (American Standard, Fourth Revision)—Sponsored by the National Electrical Manufacturers Association and approved by the American Standards Association, this publication constitutes the fourth revision of the work. In this revision, markings for capacitor motors with their many auxiliary devices and leads have been added. The section on industrial control has been augmented by the addition of new markings for resistors, brakes and starting reactors. A new section on electric water heaters has been introduced.

The standard covers the following types of apparatus: generators—a-c. and d-c.; motors—capacitor, single phase and other types; transformers—power and distribution; feeder voltage regulators—step and induction types; electric water heaters; attachment plugs and receptacles; industrial control; instrument transformers; and current limiting reactors.

The publication is priced at $1.00 a copy and is obtainable from the American Standards Association, 75 East 45th St., New York 17, N. Y.

Wood Pulp Statistics (1944)—Compiled from original sources by D. A. Dennis and published by the United States Pulp Producers Association, 122 East 42nd Street, New York 17, N. Y., this 1944 edition of Wood Pulp Statistics contains extensive basic data on the woodpulp industry of North America. It also contains such official current figures as have been released for publication by Canada, Sweden and Latin American countries, as well as certain United States data not contained in previous editions. Totaling more than 150 pages, this statistical reference work is spirally bound in blue paper cover. Price of the volume is $3.00 a copy.



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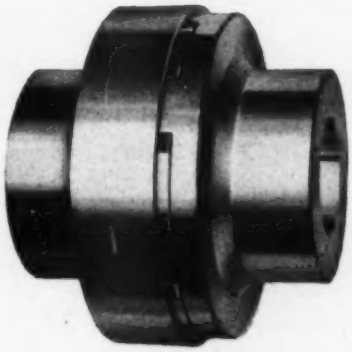

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Charts put your finger on couplings you require. Engineering data, weights, prices, right at hand. Special couplings engineered. Write or wire.

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CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

	per cwt.
Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Headings	-7.25
White Shrunk	-5.00
Silesias No. 1	-5.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-5.00
White	-14.00
Grey	-14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

Roofing—	per ton
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS — per cwt. — Nominal

New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)

ex dock New York City

OLD RAGS — per cwt. — Nominal

No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints
Ord. Light Prints
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shopperies

ROPE and BAGGING

f. o. b. and ex dock New York City

Gunny No. 1—	per cwt.
Foreign	Nominal
Domestic	2.75 to 3.00
Wool Tares—	per cwt.
Light	3.00 to 3.25
Heavy	3.25 to 3.50
No. 1 Scrap Bagging	2.75 to 3.00
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*80.00
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft jute	5.00 to 5.50
Mixed	1.50 to 2.00

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment for machine compressed bales weighing not less than 500 pounds (with differential of 5 per ton less for loose or bundled stock), and brokers' allowance of 4 to 9 per cent.

Shavings—	per ton
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, No. 1	57.50-
Soft White, No. 1	50.00-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Books and Magazines	38.50-
Mixed Books	22.00-
Ledger Stock—	
No. 1 White	46.00-
No. 1 Mixed (Colored)	40.00-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	39.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cer. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissue	22.00-
No. 1 Baled	20.00-
Old Corrugated Containers	28.00-
New Corrugated Cuts	18.00-
Mill Wrappers	22.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	19.00-

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	24.00 to 24.75
80-100 mesh (bags), lb.	—
Argentine, lb.	18.00 to 20.50
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	11.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	14.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	6.13-
F	6.21-
G	6.25-
WW	6.92-
Rosin (Wood), carlots	4.18-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.72-
Pearl, barrels, cwt.	3.83-
Paper (Sp.) bags, cwt.	3.83-
barrels, cwt.	3.92-
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to ——
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.5.60 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo. (West of the Continental Divide and in Denver, Colo., ceilings are $6 per ton lower):

Bleached softwood sulphite	86.00
Unbleached softwood sulphite	74.00
Bleached hardwood sulphite	83.50
Unbleached hardwood sulphite	71.50
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda	72.00
Unbleached soda	68.00
Ground wood pulp	50.00
Ground wood—paper machine dried and mutilated	53.00
Sulphite screenings	43.50
Sulphate screenings	38.00
Ground wood screenings	32.00
Northern unbleached sulphate siderums	73.00
Southern unbleached sulphate siderums	63.50
Standard news print siderums	50.00

PAPER

f. o. b. New York City

Boards—	per ton
Binders	84.00-
Chip	48.00-
Chip, tube and can	50.00-
Chip, full-bending	52.50-
Chip, agl. mls. lined	60.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	63.00-
News	48.00-

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)	
Book, White (M. F.)—	
A Grade E. F.	8.25
B Grade E. F.	7.80
C Grade E. F.	7.55
D Grade E. F.	7.30
E Grade E. F.	7.05
No. 2 Uncoated Offset 4 sides, White	8.45
Coated White (Trimmed 4 sides)	
No. 1 Glossy	11.90
No. 2 Glossy	10.85
No. 3 Glossy	10.15
No. 4 Glossy	9.80
No. 5 Glossy	9.30
C2S Offset	10.40
C1S Litho (Varnish)	10.05
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt. 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

Rag Content Ledger—	per cwt. Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.00
75% Rag	21.00
50% Rag	17.00
25% Rag	15.00

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M. F.) watermarked	9.00	9.70
No. 2 (M. F.) watermarked	8.25	8.85
Plain (M. F.) unwatermarked	7.60	8.20

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M. F.) watermarked	10.00
No. 2 (M. F.) watermarked	9.25
Plain (M. F.) unwatermarked	8.60

Glassine (f. o. b. mill)—	per cwt.
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50

News—OPA Ceilings	per ton
Rolls, Standard (Contract)	58.00
Rolls, Lightweight (Cont.)	62.00
Rolls (Spot)	(nominal)
Sheets	66.00

Tissues (Carlots)—	per ream
White, No. 1	1.12½ to 1.20
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.60-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.80-
Toilet, Bleached (M shts.) per cs.	5.65-
Toilet, Unbleached (M shts.) per cs.	4.25-

Towels—	per case
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05

Wrappings (Kraft)—	per cwt.
Super-Standard	5.25 to 7.65
No. 1 Wrapping	5.00 to 7.40
Standard Wrapping	4.75 to 7.15
Standard Bag	4.37½-

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)

Bleached papers— M.F. & M.G. Waxing,	per cwt.
20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75

Manilas—	
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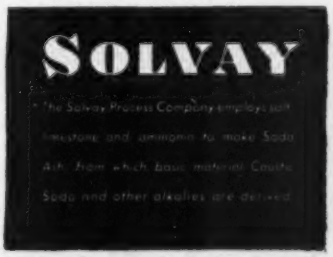

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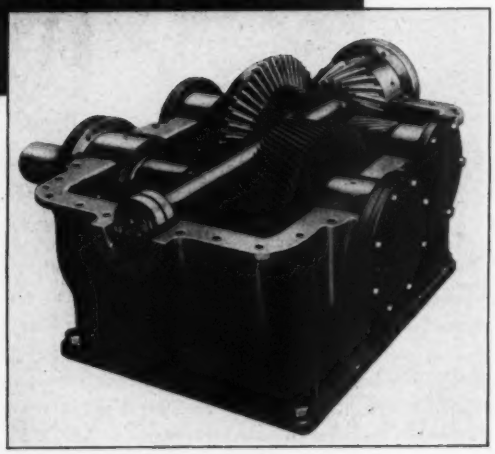

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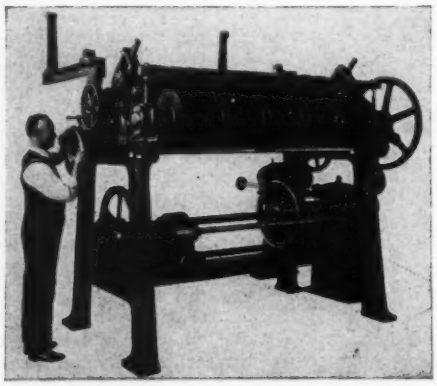

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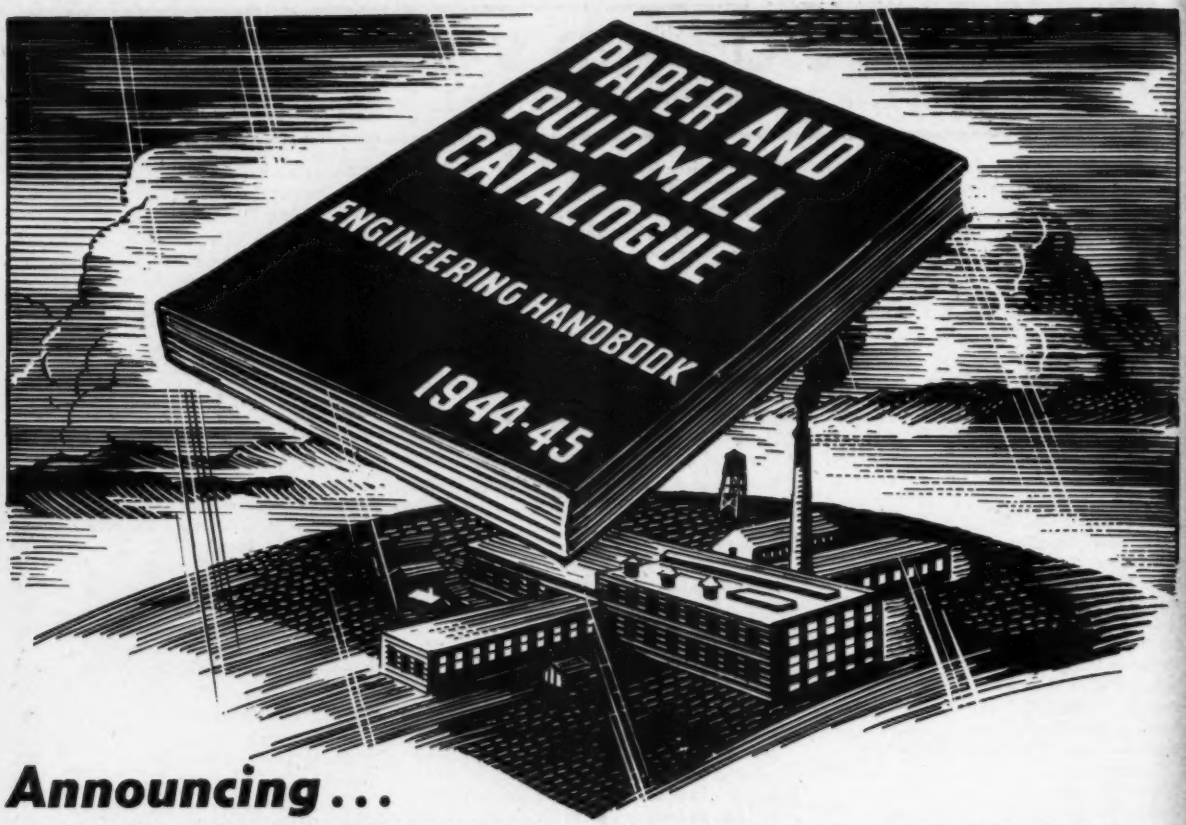

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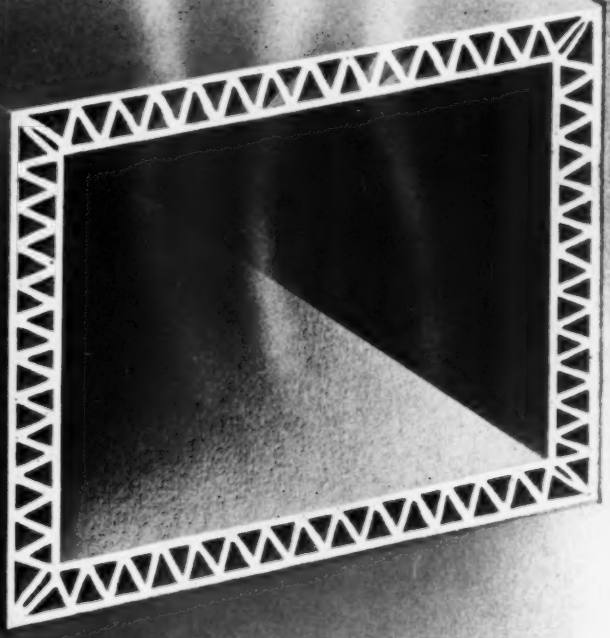

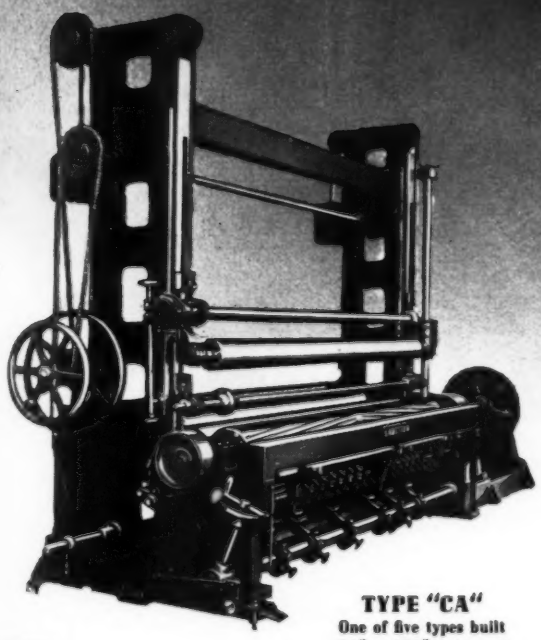

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